



ROUSIX K-12 EDUCATION CRYPTOCURRENCY

BY: TRANSLUCENT PORTALS INC.

Rousix Educational Framework (2.1 version)

TABLE OF CONTENTS

Preface.....	
Unit I: Philosophical Model	
INTRODUCTION	
Section 1: Psychological Considerations	
Introduction.....	
Motivation.....	
Rewards vs. Bonuses.....	
Earning vs. Getting.....	
Self-Reliance.....	
Time.....	
Peer Support.....	
Memory.....	
Section 2: Sociological Considerations	
Introduction.....	
Children in Crisis.....	
Problems Facing Education.....	
Interacting With Others.....	
Developing a Community.....	
Some Thoughts on Bullying.....	
Section 3: Educational Considerations	
Introduction.....	
Tradition vs. Innovation.....	
Multiple Intelligences.....	
How We Learn.....	
Bloom’s Taxonomy.....	
Life Skills.....	

Critical Thinking.....	.....
Teamwork.....	.....
The Role of Choice.....	.....
Unit II: Application	
Introduction.....	.....
Section 1: Program Overview	
Instructional Calendar.....	.....
Incentive & Merit Bonus Program.....	.....
Lessons.....	.....
Assessment.....	.....
Goal Mastery.....	.....
Questions/Problem Sets.....	.....
Pattern of Misses.....	.....
A Note of Cheating.....	.....
Section 2: Core Rousix Program	
Overview.....	.....
Rousix Core/PREP.....	.....
Rousix Enrollment.....	.....
Rousix Summer Camps.....	.....
Rousix SOS.....	.....
Rousix Book Club.....	.....
Rousix 13 th Grade.....	.....
Rousix RPG.....	.....
Rousix SIMS.....	.....
Rousix School.....	.....
Rousix Educational Centers.....	.....
Rousix Vocational.....	.....
Section 3: Ancillary Educational Resources	
Student/Member Page.....	.....
Interactive Digital Peer Tutor.....	.....
Student Savings Accounts.....	.....

Goals.....

Voting.....

Virtual Lab.....

Research Desk.....

Virtual Studio.....

Educational Tools.....

Rousix Lounge.....

Rousix Hall of Fame.....

Virtual Reality.....

Firework Shows.....

Parents Page.....

Rousix Journal and Press.....

UNIT III: Financial Information

Initial Cost.....

Controlled Growth Strategy.....

Potential Revenue Problems.....

Public-Private Revenue Model.....

Revenue Streams.....

Estimated Financial Forecast 2021-.....

APPENDICES

SAT Goals (Rousix Core/Prep/SOS).....

Proposed Enrichment Courses (Rousix Core/Prep).....

Proposed Summer Offerings (Rousix Summer Camp).....

Proposed Game Modules (Rousix RPG).....

A Sample Rousix Year.....

Comprehensive & Skill Goals (Rousix Core/Prep).....

Preface

When beginning a new project that is designed to help America's children, a company must be careful. A bottom-line number must not be your only – or even your primary concern. You must interact with real lives in a real way. Mistakes and/or mis-steps can inflict real harm.

To begin, it helps to consider some questions.

- 1) Why are we doing this?
- 2) Is there a real need for your product?
- 3) How is your product different from what is currently available?
- 4) What can we do? (Not necessarily. What do we want to do?)
- 5) Is the process sustainable?

Before we answer these questions, we must make a few general comments. You must be careful to avoid random attempts at finding an answer. You must develop a clear plan with clearly defined strategies and goals.

So let's deal with the questions:

- 1) Why are we doing this?

The answer here should never be: "to make money." At Rousix, we believe that all children can learn, but our view goes beyond this. We believe that children can thrive in the classroom and learn to make better educational decisions if given an opportunity and proper motivation. Rousix wants to give all students a leg up and help them achieve the maximal success.

- 2) Is there a real need for your product?

American schools are in a state of crisis. Millions of students lag behind their peers. The reasons are myriad: lack of interest, lack of understanding, lack of preparation, among others. You will notice that these are not necessarily classroom problems. If the problem is not in the classroom, it must be confronted where it is actually at. Rousix is a program that students will complete at home. They will do extra academic tasks in exchange for real rewards.

- 3) How is your product different from what is currently available?

Most current solutions focus on the classroom; our focus is on the individual student in a personal/private setting.

- 4) What can we do?

It's easy in these things to make grandiose claims. You can cut the dropout rate in half. You can solve all of society's problems. This is, of course, nonsense.

Our goal is a bit more modest, but it is vital and achievable. We want each student in Rousix to increase at least one grade level a year. We want to produce students who are at least ready for their current grade level when it's time to begin each year. If students are ready for a year, it is probable that they will succeed.

5) Is it sustainable?

Coming up with an idea is only half the battle. There must be sufficient funding to ensure that it can continue to exist. We believe that Rousix is sustainable after the initial investment.



We firmly believe that Rousix will serve a vital need in our society. We are committed to improving educational opportunities and outcomes for children in the United States and, ultimately, the world.

We believe that human potential is limited only by a failure to commit to its growth. We affirm that children are our future and that society has an unalterable obligation to improve our world by improving the future of all children.

Unit I: Rousix Philosophical Model

Introduction

Educational models must consider many issues in developing a philosophical framework. In this section, we will examine three major areas of thought. Psychological, Sociological, and Educational concerns. For Children to learn, these areas must be addressed.

First, we must define exactly what we believe about education. We must explain why we make choices about our educational model.

All of Rousix is predicated upon three guiding principles. We are:

1) Student-Focused

We believe that the student must be the architect of his or her own education if it is to succeed. Thus, any educational program must focus on the individual student. We want to meet the student at where he or she is actually at, not where standards say they are supposed to be. It is not helpful to give a sixth grader who is reading at a fourth-grade level passages written at his or her chronological grade level. We approach them at the level where they are at and provide remediation to ensure that they will reach an appropriate grade level.

Each student must be treated as an individual. All students have different emotional and intellectual needs that must be met if learning is to be achieved.

2) Research-Centered

Rousix will rely on methods that are informed by current educational research. We will always check our methodology to ensure that our processes follow accepted protocols. We will strive to seek-and fund-innovation.

Note: There is a difference between research and pontification. We will follow peer-reviewed studies as opposed to pundits or politicians.

3) Goal-Oriented

Rousix is committed to allowing all students to secure positive educational outcomes. All children can and should learn. This is our first and most important goal. As a result, we focus on outcomes. Offering opportunity is easy. All students have an opportunity to be exposed to an education. Outcomes must be sought; nothing worthwhile is free.

Many students will come to the Rousix platform underprepared. We must provide them a safe, supportive environment in which they can catch up to their peers and forge ahead. We will not rate students by performance on state standardized tests (though we will teach how to take them). We will focus on stronger measures of achievement: taking college entrance exams, passing these exams, and percentage of our students who graduate from college (or attending college) at one, three, five and ten years after high school graduation. For our younger students, their primary goal will be to work at grade-level or above.

We believe that developing student confidence within our program will carry over to the classroom and help students be ready to face the rigors of school and, ultimately, of modern society.

Section 1: Psychological Framework

Introduction

In this section, we will focus on a variety of issues related to the psychological aspect of education. Topics discussed here will be motivation, rewards and bonuses, earning vs. getting, self-reliance, time, peer support, and memory. In other words, mental strengths and weaknesses that can impact education.

Motivation

Motivation refers to anything that causes people to behave as they do. It is controlled by two aspects of behavior. First, motivation is created by whatever arouses the behavior. Simply put, it is an organisms response to stimuli. It is what causes living beings to initiate every action. The second aspect of motivation is direction of the behavior. This is determined by habits, skills, and basic capabilities.

Researchers have identified three basic types of motives.

A) Homeostatic Motives

These motives deal with basic survival needs, including hunger, thirst, respiration and excretion. They must be met so that the body stays in a balanced internal state.

B) Nonhomeostatic Motives

These describe more complex needs such as sex or curiosity about one's environment. They are created as a result of a specific focus. In the absence of this focus, they tend to be inactive.

C) Learned (or Social) Motives

These include a desire for novelty and a need for achievement, power, social affiliation or approval. They develop as people gain experience.

In actual usage, the three types of motives tend to overlap.

In education, we must be careful when we attempt to manipulate motivations. Rewards can be a useful motivational tool, for example, but they are limited. Instead we need to teach students to find their own satisfaction (i.e. fulfilling a nonhomeostatic or learned motive) in the learning process by emphasizing the value of being able to solve problems on one's own.

Rewards & Bonuses

Before one can do anything, one must want to do something, but increasing motivation can be tricky.

Undeniably, American students respond well when given rewards to complete academic tasks. It is important to note that in other societies this is not always helpful. However, if the reward is static, interest wanes and performance drops off. Thus, a cart-and-horse dilemma is created as we seek to find if the reward itself or the skill being learned is more important.

Researchers tell us that extrinsic motivation (like-rewards) are inferior to intrinsic motivation (learning because one likes learning). The question thus changes: How can we form intrinsic motivation in students?

Rousix believes that extrinsic motivation can be transferred to intrinsic motivation over time. If the reward motivates the student to initiate learning (and the teaching modes are of sufficient interest and novelty), eventually students will rely less on the promised reward and more on the internal task of learning a skill.

Rewards become a win-win process. They initiate the process and curiosity does the rest. Ultimately, the student gains a love of learning that will benefit him/her throughout life.

Conversely, the primary danger occurs if the student never learns to focus on anything except the reward. But, look at the behavior we will reward: graduating high school, taking and scoring an adequate score on the SAT, and gaining acceptance to a college.

Admittedly, this student may not initially graduate from college. However, real world pressures could provide a sufficient reward complex that later induces him or her to return to college and complete it. Unlike many students who find themselves in this dilemma, these hypothetical students would at least possess the necessary academic skills for the successful completion of a college degree.

Earning vs. Getting

As we see, there are some problems with rewards, especially unearned ones.

At Rousix, we never give a reward. People place little value on anything that is given to them.

Rousix, therefore, believes that all incentives that students are given must be earned by completing real work.

We commonly say that, for students, school is their job. How many adults would undertake a job that requires hours of work per day with no remuneration. This is, however, exactly what we expect from children.

Many claim, "Education is its own reward." This is simply untrue. It's ludicrous to expect positive outcomes when we treat students so differently from how we would expect to be treated.

Paying children a "salary" to complete an important task is eminently reasonable. It simply argues that a student's time-successfully utilized has value.

But we must be very careful. We cannot give students a free ride. Incentives must be earned by both a time commitment and by successfully completing academic (and other assigned) tasks.

Self-Reliance

Self-reliance is a hard concept to teach. To a certain extent, a desire for independence increases with age. However, desire often does not equate with reality.

Many students graduate high school without any real idea of how to survive on their own. They spend money as fast as they make it, never saving for future needs. Eventually, it not only puts a strain on them but also on our social system as they remain perpetually adolescent, never becoming truly productive.

At Rousix, we believe that we can address self-reliance in four ways.

A) Explicitly Teach Life Skills

We believe that we can teach life skills within two program areas. First, enrichment classes can be used to teach both cognitive and physical skills. Skills like anger management, conflict resolution, and organization can be taught and reinforced. You can give student coping skills for declining with a wide variety of issues.

You can also directly teach things like money and/or time management.

B) Follow a Schedule

Rousix will not require students to meet at specific times. We will simply tell them that they must complete so much time per day (or a period of time for a weekend). We will also require that students engaged in team assignments make and follow schedules as determined by the team as a whole.

C) The Rousix Financial Simulator

This will allow students to work on a variety of financial skills including budgeting, starting/operating a business, and investing. Strategies and concepts will deepen in complexity as the student progresses (see financial simulator in Unit II for more details).

D) Rousix Savings' Account

These will allow students to store money (at current prevailing savings accounts rates plus one & a half points; i.e. if banks are paying 1.1%, we will pay our savers 1.6%. Students will be eligible for bonuses at certain savings levels, and after meeting required levels students will be able to enroll in special programs (such as My First Car).

By teaching students to lead productive, independent lives, we make adults who are better prepared to lead successful lives.

TIME

Any introduction of time into the educational process tends to create some degree of psychological tension. At Rousix, we will introduce time pressures in four ways.

A) Daily Work Time

On Monday through Thursday, students must complete a set amount of time. This will make students complete assigned tasks on a daily basis. Failure to complete a day will result in loss of pay for that day. This requires students to work to complete a daily goal. This skill is vital for keeping jobs.

B) Weekend Blocks

Students must complete several diverse tasks each weekend. Failure to complete all tasks will result in loss of incentives on a time basis. This will help teach students how to initiate and complete projects.

C) Time Lesson Modules

Individual lessons and other modules will be timed each day. This will help students understand that learning is best facilitated in small components. Large tasks become easier when broken into small steps.

D) Timed Lessons & Assessments

We want to teach students to answer questions efficiently in order to maximize their grades. So students must answer an assigned, but not revealed, number of questions on each assignment. Failure to meet this total will result in a small incentive loss. The number of questions they must answer will be based off previous assignments. The number will typically be different from assignment to assignment and subject to subject. However, students must minimally answer at least 2 questions per minute.

The introduction of time will no doubt lead to the creation of some amount of anxiety. By showing that this can be overcome in a safe environment, we will make students better test takers.

Peer Support

People are most comfortable when they are safely within a peer group. This is natural. We deal better with life when we are surrounded by people who are like us. Yet, the peer group has been given a bad reputation. In truth, they can equally be good or bad, so they must be measured by results.

Rousix believes that students are more likely to succeed when they are a part of a strong, supportive peer group.

We will address this issue in several ways.

First, we will give Rousix students a place to safely assemble. They can safely ask and answer questions concerning school work and other areas of interest. By providing a place where students can interact with their peers from around the country and, ultimately, from around the world. Our lounge will provide a safe environment where knowledge can be freely shared.

Next, age- and vernacular-appropriate digital tutors will help build student interest in the program. Digital tutors cannot and should not replace real friends, but they can help a student get comfortable with the program. They can also help shy children gain confidence to transfer to conversations with their age mates.

Memory

Memory is the common used term that describes two concepts: (1) It is the ability to remember something learned or experienced and (2) it is related to the brain's ability to store information.

Memory is a vital part of the learning process. Without it, learning would, in fact, be impossible. If the brain recorded nothing from the past, nothing would ever be retained. All experience would be lost when it ended.

Generally, there are three types of memory systems:

A) Sensory Memory

This hold information for one to two seconds. If you look at a picture of a mountain, a near exact visual image of that mountain is stored in visual sensory memory, but it fades quickly if one does not actively attempt to remember it. Sensory memory enables us to interact with the world.

B) Short-Term Memory

Contains what one is actively thinking about at any given moment. It holds a fact for as long as it is actively though of. Once it is no longer actively considered (typically through repetition) it fades in twenty to thirty seconds.

C) Long-Term Memory

Stores facts, ideas and experiences after they are not actively considered.

All conscious processing of informational thinking or problem-solving involves the short-term memory working actively with long-term memory. Commonly, this is termed working memory.

Forgetting is the opposite of memory. It can be instructive to briefly look at the four reasons for why people forget.

A) Interference

Occurs when the remembering of certain learned memory blocks the memory of other learning. For example, if a friend moves, knowledge of his old number can make learning the new one harder. If the interference is beneficial, it is termed proactive. If it hinders learning, it is called retroactive.

B) Retrieval Failure

The inability to recall information that has been stored in memory. In most cases, forced recall proves impossible, but the information will come naturally later. In this case, the information is available, but it can't be found.

C) Motivated Forgetting

Occurs when people are trying to forget something. This can be done consciously (suppression) or unconsciously (repression).

D) Constructive Processes

Deals with the creation of false memories. When we cannot completely remember something, the mind will construct probably happenings to tell a complete story. This process, called confabulation, creates "memories" so real that they are almost impossible to distinguish from memories that actually occurred.

Finally, memory can be increased with practice. Some techniques that help include using mental aides (including mnemonics-rhymes, acronyms, mental pictures and other memory reminders) and rehearsal (information is repeated and elaborated upon).

In addition, memory works more effectively if similar environments are used for both learning and recalling.

Section 2: Sociological Considerations

Introduction

In this section, we will look at how society impacts education. Topics will be a look at problems facing education, interacting with others, and developing a community. By studying these things, we can best see how to minimize societal interference with the educational process.

Children in Crisis

- Family
 - Breakdown of Family
 - *Sex and marriage were delinked with the advent of birth control pill
 - *The feminist revolution transformed gender and marital norms
 - *Millions of women, in part freed from patriarchal norms, in part driven by economic Necessity, in part responding to new opportunities, headed off to work
 - *The end of the long post war boom began to reduce economic security for young working class men
 - *An individualist swing of the cultural pendulum provided more emphasis on self-fulfillment
 - *Collapse of traditional family hit the black community the hardest because they were already clustered at the bottom of economic hierarchy
 - Family factors affecting children
 - *Mother's age at birth – older parents are better equipped to support their kids both materially and emotionally. College educated mothers = late 20s/early 30s; High school – educated mothers – late teens/early 20s

*Unintended Births – High school educated women start having sex earlier, use contraceptions or abortion less often, and have more unintended pregnancies than college-educated mothers. Planning for kids affects amount of resources available for child.

*Nonmarital Births – College (19%); High School (65%)

*Divorce: College (14 per 100 marriages) High school (24 per 100 marriages)

*Multiparter Fertility

- Compared to college graduates, male high school grads are 4 times more like to father children with whom they do not live

- Brain Development Studies

- Children who grow up in poverty are at a higher risk for elevated levels of cortisol, a stress hormone. Poverty seems to contribute to a context of chaos that impinges on children's physiology
- A part of the brain responsible for emotional regulation is impaired in adults exposed to the stresses of poverty as children
- Differences in brain waves of children from lower and upper-class backgrounds that suggested the former had more difficulty concentrating on a simple task because their brains had been trained to maintain constant surveillance of the environment for new threats
- MRI evidence of slower brain growth in children living in poverty
- Kids from upper-income, well-educated homes benefit from richer verbal interaction because their parents have larger vocabularies and use more complete syntax. By time entering kindergarten, children of professional families heard 19 million more words than the children of working-class parents and 32 million more words than children of parents on welfare
- 72% of middle class children know the alphabet when starting school, as opposed to 19% of poor children.

Problems Facing Education

Education in the United States is in crisis. Many problems appear to be so deeply ingrained that they may be intractable, but they do merit brief discussion.

Many school problems are systematic; they affect the systeming as a whole. The American education system is egalitarian. We attempt to provide a common level of education to all children at both the same instructional level and to the same level of understanding. For many skills, this proves a good idea. Literacy and basic academic skills

should be universally taught and learned. Algebra II and Physics, for example, need not be. Our schools have rejected vocational programs, and replaced them with universal college prep. This becomes problematic. It creates even more problems when the rationale for this decision is never explained to students. Thus, students study subjects that they (1) simply do not need and (2) do not know why they have to take them.

Vocational education has a negative connotation for many educators. This makes little sense. Students who would thrive in a vocational environment suffer in a college preparatory one. While Rousix does believe that all students can go to college, it is foolish to expect it to happen. We will offer opportunities to explore vocations through enrichment. If a student decides college is not for them, we will provide technical and/or vocational opportunities that eventually will include an apprenticeship program.

In many cases, politics deeply impact education. Starting in the 1960's, White flight to the suburbs left most inner-city schools de facto segregated. As the fundamental religions grew in strength and tried to pull away from mainstream society, this flight increased, but pulled students from the suburbs as well. Significant numbers of religion-based private schools were created. Since these were fee-based, many parents begin to insist to vouchers to subsidize their child's tuition.

There two problems with vouchers. First, they take money from public schools that are already overextended. Second, these schools are exempt from state standards. This often leads to a grossly water downed curriculum that focuses too much on religion and too little on academic rigor.

To be fair, the public and private school systems are similar in that a few are excellent and a few are awful while the vast majority is mediocre. Eventually, however, public schools reach a state of ineptness so drastic that state regulators can take over school operations. No such safeguards exist for students in private schools.

Next, we will look at problems seen at the individual school level. Most schools are top-heavy. Too many layers of administration create bureaucracy where innovation goes to die. Teachers are rewarded for getting students to pass standardized tests, rather than truly helping them learn. Teaching is replaced with a cookie cutter process that eventually fails all involved.

It is undeniable that standardized testing has adversely impacted education. To begin, there is nothing wrong with standardized testing, provided it's utilized for its intended purpose. They are great diagnostic tools for pinpointing problem areas. The problem arises when it becomes the end-all of the educational process. Schools are judged as a success or failure based on a score on a single test.

Consider how standardized tests are normally used. Tests like the SAT or GED are barrier tests. One must perform at a certain level as evidenced of readiness for future academic endeavors. The test is taken once prior to enrollment in your chosen program. These tests are not graded and may not serve as an absolute barrier to continuing your education.

In public schools, testing is performed at the end of the year. At certain grade levels, it can serve as a barrier to advancement, but this is not commonly enforced except at Exit level. In some states, it actually affects grades on report cards. Its use as either a report card and/or indictment of the school, the teacher and the students.

Administration focuses on the test, eventually excluding the student's best interests to do so. Thus, students may learn how to pass a standardized test but little else.

Next, we will turn our attention to teachers.

For the most part, the majority of teachers are competent professional, dedicated to both their craft and to their students. Unfortunately, they are often denied needed tools. Budget constraints limit what is available.

That being said, it is also true that some teachers are bad. Reasons vary. Some are defeated by a bad system. Some simply burn out. Some never cared. Regardless of why they're bad, they are a barrier to student learning. However, it is very hard to remove bad teachers. Worse, they're presence tends to harm the most vulnerable students: minorities, the poor, inner city children, special education. Simply put: Wealthy schools have good teachers, others take what is available.

In addition, parents can also be problematic in the educational process.

They enable a child's failure by offering unconditional support for their misbehavior. Moreover, the parents of poor students were often poor students themselves. Schools intimidate them. Teachers and administrators gang up on them by using specialized vocabularies they do not understand. They can't help their child because they lack the necessary academic skills. No longer beholden to the school, these parents develop a hatred of it. This, in turn, is passed along to their children.

While it is partially illuminating to describe school failure in terms of the above major shareholders, we must remember that much of the blame for failure must be placed on the students.

Many people overcome horrendous situations to succeed. But we remember these because they are exceptions.

For most, impossible situations remain impossible. They spiral into failure in almost every aspect of their life. These students are hard to reach and even harder to help.

This idea that education is neither necessary nor important is a significant social problem. Rousix believes that incentivizing education will help turn this problem around.

When education is given financial worth, students will work hard to maximize possible incomes. As they do this, they will soon discover the true value of education as well as improve the potential for successful life outcomes.

Interacting With Others

It is important that students form bonds with both their peers and others. It impacts both the student's educational process as well as his or her social development. Unfortunately, it is hard to teach this vital life skill on a tech platform.

We will encourage students to work on developing social skills virtually. Our students will regularly interact with others from across the country, both as part of regular lessons and for non-required activities.

While we can't replace face-to-face contact, we can encourage a broad array of communication – professional, formal, and casual - with many different types of people.

We recognize that people communicate differently depending on their audience. For example, one talks differently to a judge than to a teacher than to a friend. We believe children must be given opportunities to practice all of these communication skills frequently.

Developing a Community

It has been said, "It takes a village to raise a child."

At Rousix, we believe this. We do not want to create a site where students stare at a monitor and answers questions.

At Rousix, we will guide development of our product based on the following rules.

- 1) Students must have diverse opportunities to interact with others, including both other students as well as adults.
- 2) Students will be encouraged to ask questions when they need knowledge and answer questions when they have knowledge. We will put our students in situations where they can earn either points or prizes for engaging in positive social interactions.
- 3) Students will be given an opportunity to vote on topics relating to Rousix and to the world at large. We want them to know that voting is important and that their impact is worthwhile

Some Thoughts of Bullying

Rousix will not tolerate online bullying in any form. Learning cannot happen in an environment of fear. Students that engage in online harassment of a student will be banned from the site for one month. A second infraction will result in a one-year ban. Farther infractions will result in a lifetime ban.

No child should have to feel inferior because of his race, size, religious affiliation, sexual orientation, or any other personal characteristic.

We are absolutely committed to making certain that our students and members have an absolutely safe haven. We're aware that this doesn't reflect the real world but we are not the real world. We aim to be a place that ensures optimal educational efforts and will take what actions are necessary to ensure it.

We are fully aware that not all conflict is bullying. People often hold contradictory opinions. There is a difference between respectful disagreement and bullying, however. We will monitor conflicts to ensure that they remain friendly.

Section 3: Educational Considerations

Introduction

This section forms the centerpiece of our philosophy of Rousix. Here we will look at the following issues: tradition vs. innovation, multiple intelligences, how we learn, Bloom's Taxonomy, life skills, critical thinking, teamwork and the role choice plays in education.

Note that these are large, theoretical issues. We will deal with them as we move into application in the next unit.

But we need to deal with our overarching educational philosophy so that we can point out our direction.

Tradition/Innovation

Education has long faced a dichotomy between the role of traditional educational practices and innovation.

Traditional educational methods do, in fact, work. That's why they're traditional. Study after study has shown that students learn best when directly taught by a human teacher. The smaller the group the more efficient the progress. In fact, the best educational arrangement is one-on-one with a trained teacher and a student. With only one student, a teacher can fully read and respond to a student's learning process, provide immediate input and remediate difficulties as they occur.

We believe that modern artificial intelligences can replicate this mode of instruction. The machine will never be able to "read" a person as well as another person can, but can successfully see signs of struggle and works to remediate and reteach.

In terms of raw analytical ability, computers are far superior. They can quickly and efficiently analyze patterns of answers for millions of students over many years. Yet, they will lack the instinctual knowledge that the student simply does not get it.

Getting an answer right and understanding a concept are often two entirely different things. Timing models are inefficient because sometimes students need extra processing time for some skills. Taking time to determine the correct answer to a complex problem is radically different from random guessing.

Technological innovation represents the future of education.

Rousix proposes a two-pronged approach to this dilemma.

First, we will let computers excel where they do. Computers will analyze answers and find patterns. When a problem is indicated, a technician will be alerted. He or she will analyze the computer's response and confirm or reject the rationale. Regardless, he will give his own rationale. The computer will consider these responses in future analysis.

If necessary, the technician will be able to pass the response to education specialists for complex issues.

In some cases, answer patterns may be inefficient in solving problems. An education specialist will video conference with the student and make judgements as the skill is performed. This will allow the specialist to ask for special input.

Ultimately, the computers AI will grow more proficient at analyzing responses, and the digital tutor will become a more efficient and accurate teacher.

Multiple Intelligences

The theory of multiple intelligences was created by Howard Gardner in 1991. According to this theory, students possess seven distinct intelligences. The intellectual combination of these intelligences determines how we learn, remember, perform and understand. The manner in which these intelligences are invoked and combined allows people to carry out various tasks, solve diverse problems and progress in various educational domains.

Gardner argues that since each student learns best in a unique way, it is counterproductive to assess them utilizing a single measuring tool.

The seven learning styles are:

1) Visual-Spatial

- think in terms of visual space
- like to draw, solve jigsaw puzzles and read maps
- teaching methods: drawings and verbal and physical imagery
- useful educational tools: models, graphics, charts, photographs, drawings, video and multimedia

2) Bodily-Kinesthetic

- use the body effectively; keen sense of body awareness
- teaching methods: physical activity, hands-on learning, acting out, role-playing
- useful educational tools: Equipment and real objects

3) Musical

- shows sensitivity to rhythm and sound; love music and are sensitive to sounds in their background
- teaching methods: turning lessons into lyrics, speaking rhythmically, tapping out time
- tools: Musical instruments, music, multimedia

4) Interpersonal

- understanding and interacting with others; tend to have many friends, empathy for others and street smarts
- teaching methods: group work, seminars, dialogues
- useful educational tools: telephone, time and attention from instructor, writing, computer conferencing, email

5) Intrapersonal

- Understanding one's own interests & goals; shy; in tune with their inner feelings; independent learners
- teaching method: independent study, introspection
- useful educational tools: books, creative materials, diaries, privacy and time

- 6) Linguistic
 - Using words effectively, highly developed auditory skills, think in words
 - Likes reading, playing word games, making up poetry stories
 - Teaching methods: encourage students to see and say in words, reading together
 - Useful educational tools: computers, games, multimedia, books, tape recorders, lectures

- 7) Logical-Mathematical
 - Reasoning, calculating, think conceptually, abstractly, see patterns and relationships
 - Must learn and form concepts before dealing with details

How We Learn

Learning is a continuous process, but it defies an easy explanation. Typically, four types of learning have been identified:

- 1) Classical Conditioning
 - Based on the stimulus-response relationship. Stimuli excite one of the senses
 - Many stimuli elicit specific responses on an instinctual level
 - Learning occurs when a new response is formed in conjunction with an older response
 - Responses learned from classical conditioning are called either conditioned responses or respondent learning

- 2) Instrumental Conditioning
 - Occurs when a person learns to perform a response as a result of what happens after a response is made
 - No one stimulus elicits this response, it is done only because it is rewarded
 - Every time the reward is received, the tendency to engage in the behavior increases
 - Also known as operant conditioning because the learned response operates on the environment to produce some effect

- 3) Multiple-Response Learning
 - Occurs when we learn skills by learning a sequence of simple patterns
 - These patterns can be combined to form more complicated behavior patterns
 - Learning that requires many responses requires extensive practice
 - The beginning and end parts of these tasks are easier to learn than is the middle
 - Also called chaining

- 4) Insight Conditioning
 - Attempting to solve problems through understanding the relationships of various parts of the problem
 - Insight often occurs suddenly and can replace trial and error to solve problems

Next, we will briefly look at the factors that promote learning.

A) Amount of Practice

How much a skill is practiced is certainly important, but it is not of primary importance. Practice performed correctly is more important.

B) Psychological Feedback

This is a key element of the learning process. Feedback should be immediate and complete

C) Task Complexity

Harder tasks require more time to learn

D) The Role of Memory

Memory plays a primary role in the educational process, as does forgetting. The human brain is capable of retaining vast amounts of information. This is mainly accomplished through clustering or grouping like objects. In retrieval, we first locate stored data in an associative network and then select an item with a specific character. Retrieval works better when it is practiced.

E) Work Distribution

Keep these guidelines in mind

- Mass practice is superior for simple discrete tasks
- Distributed practice is superior for complex continuous action tasks
- Short practice sessions are better than long ones
- Long rest periods are superior to short ones
- Proficiency levels grow as the interval is lengthened
- Cramming works (provided there is time for sufficient rest)

F) Readiness to Learn

Learning occurs more efficiently if a person is ready to learn. Readiness to learn results from a combination of growth and experience.

G) Motivation

Learning occurs best when a learner wants to learn. Extrinsic motivation, primarily in the form of either rewards or punishments, are common. Both can be problematic. Punishment tends to be less effective than reward. People would rather get something rather than lose it. Rewards come with downside, as well. They tend to work initially, but tend to hinder later as students get used to them.

Intrinsic motivation occurs when we choose to learn for the sake of learning. Intrinsic motivation is much more powerful than is extrinsic motivation. A primary educational goal should be the development of intrinsic motivation even while extrinsic rewards are being given.

In an ideal learning situation, learners set progressively harder goals for themselves and work at the task until they succeed. Note: from the point of view of the learning motivation is judged as a success or failure, based on reaching these goals or not.

H) Transfer of Training

New learning can profit from old learning because learning one thing helps in learning something else. This transferred of training can be positive (learning Task 1 makes learning Task 2 easier) or negative (learning Task 1 makes learning Task 2 harder).

Now learning benefits from old learning because of positive transfer of training, general principle (what's learned at one task often applies to other tasks), and the fact that good study habits learned during one task helps us to learn others.

Rousix will primarily base its learning style on the following seven rules:

- 1) Within a given amount of practice time, you can learn more easily if you work in short practice sessions spaced widely apart
- 2) You learn many tasks best by imitating experts
- 3) You should perform a new activity yourself, rather than merely watch or listen to someone
- 4) You learn better if you immediately know how good your performance was
- 5) Practice difficult parts of task separately and then incorporate them into the process as a whole
- 6) The more meaningful the task, the easier it is to learn
- 7) A part of the task is learned faster when it is

Bloom's Taxonomy

In 1956, Benjamin Bloom and his associates created a framework for categorizing knowledge along a continuum from simplest to most complex. He put knowledge into six broad categories:

- A) Knowledge - recall of specifics and universals; methods and processes; and of patterns, structure and setting.
- B) Comprehension – the learner understands what is being communicated without understanding all implications.
- C) Application – how knowledge is used in specific circumstances.
- D) Analysis – understanding relationships between ideas.
- E) Synthesis – Putting elements and parts together to form a whole.
- F) Evaluation – Rendering judgements about the value of the materials.

In 2001, a group of cognitive psychologists, curriculum theorists, instructional researchers, and assessment specialists revised the taxonomy. Rousix will utilize this revised form:

- 1) Remember
 - A) Recognizing
 - B) Recalling
- 2) Understand
 - A) Interpreting
 - B) Exemplifying
 - C) Classifying
 - D) Summarizing
 - E) Inferring
 - F) Comparing
 - G) Explaining
- 3) Apply
 - A) Executing
 - B) Implementing
- 4) Analyze
 - A) Differentiating
 - B) Organizing
 - C) Attributing

- 5) Evaluate
 - A) Checking
 - B) Critiquing

- 6) Create
 - A) Generating
 - B) Planning
 - C) Producing

Generally, the verbs are the 6 domains, and the participles are “skills” words. Rousix feels that this model of the taxonomy is both easier to understand and provides more help for both student and teacher.

As the taxonomy was revised, the researchers created a new taxonomy of the type of knowledge used in cognition.

- 1) Factual Knowledge
 - A) Knowledge of terminology
 - B) Knowledge of specific details and elements

- 2) Conceptual Knowledge
 - A) Knowledge of classification and categories
 - B) Knowledge of principles and generalizations
 - C) Knowledge of theories, models and structures

- 3) Procedural Knowledge
 - A) Knowledge of subject-specific skills and algorithms
 - B) Knowledge of subject-specific techniques and methods
 - C) Knowledge of criteria for determining when to use appropriate procedures

- 4) Metacognitive Knowledge

- 5) Strategic Knowledge
 - A) Knowledge about cognitive tasks, including appropriate contextual and conditional knowledge.

- 6) Self-knowledge

It is important to use a structured taxonomy because it helps to clarify objectives of both the teacher and his/her students. Bloom’s Taxonomy helps in planning and delivery of appropriate instruction, in designing valid assessment tasks and strategies, and in ensuring that instruction and assessment are aligned with the objectives.

Life Skills

Educators have a social obligation to teach more than academic concepts. They need to teach students how to live happy and productive lives. This includes instruction in a variety of all sets that include goal-setting, financial accountability, and decision-making, among others.

We will carry out these goals through various supplementary and/or ancillary materials.

Practicing life skills makes students utilize a variety of academic skills. In fact, many life skills require a combination of most academic skills.

To be a productive citizen, one must be able to perform certain activities. Unfortunately, in most cases, they are not explicitly taught. One is expected to just understand them. Take voting for example. Students are told that voting is important, but for those under the age of 18, any practice proves unrealistic. They may vote for homecoming queen of most popular. At most, they engage in a mock presidential election that counts only students in your school.

At Rousix, we will allow students to vote for real issues that impact their education as well as enact nationwide mock elections, both state and federal. We will provide plentiful analysis of these results, compare them to the real election, and show how local election results differ from national ones.

Other skills, such as money management, can have an even more significant impact. By teaching students to better manage incentive funds, we can encourage them to engage in habits that will physically improve their lives – by creating real savings for college or beyond – as well as their outlook – knowing how to budget money.

Critical Thinking

Critical thinking is an oft-ignored part of the educational progress, yet it is a critical skill. However, almost no one, including many colleges, teach this skill well. At its simplest critical thinking is the ability to develop and implement solutions to complex problems. No matter how much one theorizes, one plus one equals two. And it always will. Considering why this is true changes nothing.

So, it begs the question: What is a suitable topic for critical thinking?

Critical thinking questions answer the question “why?” A child may ask, “Why is the sky blue?” When we answer it, we must utilize the power of imagination (the creating of myth) and science (usually, right but boring). When we think critically, we determine which of these is more likely correct. This is not an easy skill to learn. We will directly teach critical thinking

protocols in the enrollment process and then reinforce it throughout the year within lessons.

Rousix believes that all students can become more efficient critical thinkers with thirteen years of scaffolded instruction with frequent reinforcement during activities.

Teamwork

Our modern work environment requires that people be able to work together to accomplish a task. These types of skills do not come easily to most people.

The necessary skills for teamwork cannot be directly taught. They must be practiced.

In technology-based programs, teamwork is difficult to incorporate. Technology has traditionally been a one-on-one instructional mode.

At Rousix, we believe that there are ways to teach this vital skill. In fact, we believe that teamwork in Rousix will align closely with real world parameters as students must schedule and arrange times for team meetings rather than merely utilizing time assigned by a teacher.

The Role of Choice

For education to be truly effective, students must be given a large ownership stake in their own education.

While we require students to achieve specific tasks, we will allow students to choose how they way to do it. They will make choices involving timing, arrangements of materials, and what aspects of the system they will utilize.

In timing, we will require students to complete a specific amount each week Monday through Thursday as well as each weekend. Students will have complete control over this time. They could do it all at once or break down into any desired segments.

Moreover, students will be able to decide what order they wish to complete activities. Lessons will be made available to complete in the order that the individual student desires.

In addition, we will offer many ways to learn from our primary education programs and games. Students can always choose which of our programs with which they wish to engage.

UNIT II: APPLICATION

Introduction

We believe that our educational program will only be as effective as we are able to follow our education philosophy.

Our goals are simple:

- 1) To help students become more efficient learners
- 2) To prepare students to become more productive citizens of our country and the world.

We hope to help students become a more complete person who are ready to take on and overcome challenges. Many children born into poverty have an almost inborn sense of inferiority. We want to teach them that this idea is false, and teach them the skills necessary to become leaders of our nation and the world.

Grand goals require grand plans. We must carefully map our path to ensure that our goals are being met. We must be willing to utilize innovation, and not to fall into the It's-always-been-done-this-way trap.

At Rousix, we will explore the very idea of education and hone our focus only on what is best for the student.

SECTION I: OVERVIEW

Instructional Calendar

Our primary programs will run from the Tuesday following Labor Day for 251 calendar days (36 weeks). The core academic program will run from Monday to Sunday.

The Rousix semester will be followed by sign-ups for our Summer Camps and SOS Program. Summer programs will begin June 1 and will run 45 days. There will be three 15 days camp sessions; SOS will run for the entire period. Back to school activities will be available from August 1-31.

Incentive and Merit Bonus Program

The incentive and merit bonus program is the heart of Rousix's education process. Incentives will be given to students for successfully completing assigned tasks.

There will be penalties for failing to meet assigned (or chosen) goals. Penalties will lead to loss of daily incentive. Failure to meet goals at an excessive level can result in temporary suspension for the program.

Merit bonuses are special rewards for performance of required tasks. They will be earned (or not) at each student's choice. The only applicable penalty is loss of the bonus. Merit bonuses, once missed, cannot be made up. The student will be able to still earn future merit bonuses merely by meeting their criteria.

Missed incentive days can be made up. However, no more than 10 weekday lessons and two weekends can be made up. Holiday weeks cannot be made up.

Lessons

Lessons will be largely guided by student choice. Students will choose a goal from a list of options and complete the lesson. Once a lesson has been covered at least once, it will be possible for a question to be asked about any previously covered lesson.

e.g., if you did a lesson on main idea last week, and now you're working on sequence of events, it will be possible that the student has to answer a question about main idea with that lesson. If it is the first time a student is exposed to a concept, no outside questions will be asked.

Thus, as the student moves into the year, there will be a larger and larger catalog of questions that can be asked. Each of these "bonus" questions will be used to push a student forward mastery of that goal within the assessment process (see below).

ELA and Math lesson plans call for each to be broken into three segments and will last for 24 minutes. Social Studies and Science lesson plans last for 10 minutes and are divided into two segments.

In ELA and Math lessons, segment one will be 8 minutes. This segment will open with a video that introduces the topic (45 seconds - 1 minute). The video is designed to help the student activate prior knowledge

and build interest. The video will be followed with an explanation of the lesson's goals and objectives (30-45 seconds). The remainder of the lesson will consist of direct instruction. Within the program, direct instruction will take on a variety of forms. We want to have the ability to present the information in a variety of ways, so that we can hit a variety of different learning styles. We believe it is important to approach students in the way they learn best

The lesson's second segment will last for 12 minutes. This is the primary work module of the lesson. Students will answer a minimum number of tasks to complete the lesson. The number required will fluctuate depending on the lesson and student mastery level. Students will be given immediate feedback upon answering a question.

e.g., if students answer correctly, they can pick a virtual firework. If they miss, they will see an explanation why. At the end of the lesson, they can see their firework show.

The final part of the lesson cycle will be a four-minute segment. This segment will be used for remediation or enrichment.

The science and social studies lesson modules will be 10 minutes in two segments. The first segment will last for 1 minute, 30 seconds to two minutes. Students will watch a video (45 seconds - 1 minute) and go over lesson goals and objectives (45 seconds to 1 minute).

The second segment will last eight minutes. Here the student will receive direct instruction in a variety of ways (for example they may watch a computer animation of the Battle of Gettysburg if they are covering the U.S. Civil War or take a virtual tour of the battlefield). The instruction will be interrupted five times with questions that must be answered correctly to advance.

Assessment

We will assess both formally and informally. Formal assessment will be conducted each weekend. Each core subject will be tested. The assessment can consist of any previous material (included those marked mastered).

Typically, each 20 questions on the assessment will consist of ten questions covering material from that week, eight questions from previously covered but not yet mastered material, and two questions from previously mastered material.

Informal assessment will be given in Thursday review sessions (in core) as well as throughout daily work.

Goal Mastery

Goal Mastery in Rousix will be a tiered process.

First, the goal will be mastered in lesson. Each goal has a number of subgoals. Subgoals will be covered three times. To achieve lesson mastery, the student will make consecutively equal or higher scores in daily work. Due to spaced repetition, most goals will be lesson-mastered four to six weeks after the initial introduction of the skill, though it may take longer for some goals.

Students must also master goals in assessment. To master a goal, students must answer at least 100 questions about a goal at an 80% mastery level (80 of 100 questions answered correctly). After the initial practice lesson, all questions asked about a goal are counted toward assessment mastery.

These goals are intentionally difficult. Thus, we will offer a merit bonus for completing goals during the year.

Questions/Problem Sets

Question sets, whether for lessons or assessments will be large. Each subgoal will have a question set consisting of 600 problems. Of this number, 200 questions will be at grade level, 200 will be above grade level, and the final 200 will be below grade level. Questions above and below grade level will be further divided as follows: 100 questions will be one level above/below, 70 questions will be two levels above/below, and 30 questions will be three levels above/below. If a student works too much at three or more grade levels below his own, we will move his material to a lower grade level, as necessary.

For those who are in high school who works above grade level, we will create sets above high school level questions.

Generally, any type of problem is acceptable except for True/False or Yes/No - style questions. These questions only attempt to trick students, and may play a major role in the creation of "false" facts.

The following problem types/formats will be utilized:

A) Multiple Choice

These questions consist of a stem and 2-5 answer choices depending on grade level and student ability. For students with diagnosed learning disabilities or other problems that can impact learning, answer choices may be reduced.

B) Matching

Matching problem sets consist of groups of stems and answer choices. Commonly, there is one answer choice per stem. Educators regularly utilize two variations. There can be fewer answer choices than stems. Thus, some answer choices must be used more than once. Secondly, there can be more answer choices than stems. This means some answer choices will not be used. At Rousix, we have a bias concerning these latter two formats. To modify, one can remove extraneous choices, tell students how many times each answer will be used, and/or divide answers into smaller lists.

C) Fill-in-the-Blank

Students must type a single word or sort phrase to complete a sentence or answer a question. Modify by providing students with a word bank.

D) Sentence

Students respond to a question by writing a single complete sentence. Modify by allowing students to answer with a phrase.

E) Short Answer

Students respond to a question with 3-5 sentences. To modify, ignore sentence structure for key words.

F) Essay

Students answer a prompt in three to five paragraphs. These question types will primarily be used in the research/lab module. They may take more than a single session. To modify, simplify essay structure.

We will like most questions to be fill-in-the-blank or writing sentences. Others will be used as necessary.

Pattern of Misses

We think that breaks in activity are necessary to the learning process, particularly when a process is either too easy or too difficult.

If the lesson proves to be too easy, the following protocol will be used:

- A) If a student answers 10 consecutive questions correctly, he will receive a merit bonus and will have an enforced five-minute break and will be given the option of playing an arcade style game. When the lesson resumes, the question level will increase by one grade level.

If the lesson proves too difficult, the following protocol will be used:

- B) If a student misses five questions in a row, he/she will be required to take a break. The system will launch an arcade-style game. After time elapses, the lesson is resumed and the student will be asked two more questions at current level. If both are missed, questions will be lowered by one level, and the process will begin again.

Note 1: In protocol A, missing 5 questions at a higher grade level does not trigger the game break. Questions merely revert to the lower level.

Note 2: Students are not required to play the game. They can close the game and engage in other Rousix activities or merely leave their computer/tablet. Re-entering a lesson before five-minutes have elapsed only causes a return to the game.

Cheating

At Rousix, we believe that the creation of sufficiently interesting lessons will lead to students who are motivated to do their own work. Thus, we do not expect cheating to any real extent.

But given human nature, we will design our programs to limit some common forms of cheating.

- * Question sets are large and leveled. Each student will have a customized worksheet

- * Geographic filters will ensure that students who live close to one another will have different assignments.
- * Assessments will be generated with an eye toward maximal variation
- * Students will sign an honor oath at the beginning of each school year

SECTION 2: THE ROUSIX FAMILY OF EDUCATIONAL SOLUTIONS

Overview

In this section, we will provide an overview of each Rousix Educational Solution. This list is subject to amendment as we add or delete programs at future dates.

For each program, we will include a description of the program, anticipated launch date, and information about incentives and/or merit bonuses.

1). Rousix Core/Prep

A) Objective

Rousix Core will help students catch up with and surpass their peers in academic achievement. Rousix Prep will be a college preparatory program for high achieving students in grades 6-12

B) Overview

Students will be responsible for completing 65 minutes of work each Monday through Thursday (80 minutes for Prep), 225 minutes each weekend (255 for Prep), and 255 minutes during holiday weeks (285 for Prep).

Students will be able to select their own activities within the following limits on weekdays

- * Students will be given list of available lessons (see calendar).
- * After completing a lesson, they will choose a break activity from list.

* Items will be removed from the list as completed.

Rousix Core can be utilized by any student (public, private, or home-schooled) as a supplemental program to their assigned curriculum.

C) Anticipated Launch Dates

- Rousix Core
 - * Launch - January 2022
 - * First Classes - September 2022

- Rousix Prep
 - * Launch - January 2024
 - * First Classes - September 2024

D) Fee

\$2500/Student/year

E) Calendar

Core and Prep will run for 36 weeks (251 calendar days) from the Tuesday following Labor Day until early May. Students will be given four weeks of breaks: Thanksgiving Break (Monday - Sunday of Thanksgiving week), Christmas/New Year's Break (two week break that will encompass both holidays), and Spring Break (one week in March). In addition, students will receive a day off for each of the following holidays: Columbus Day, Veteran's Day, Martin Luther King's Day, President's Day.

Activity	Core week/year (in minutes)	Prep week/year (in minutes)
Weekdays (M-T)	240 / 8640 (144 hours)	320 / 11520 (192 hours)
Weekends	225 / 8100 (135 hours)	255 / 9180 (153 hours)
Holidays	255 / 1020 (17 hours)	285 / 1140 (19 hours)
TOTAL (YEAR ONLY)	17,760 (296 hours)	21,840 (364 hours)

NOTE: On holiday schedule, students will have 7 days to complete the assigned activities (avg. 36 min/day- Rousix Core and 39 min/day- Rousix Prep.

The following schedules are initial and may be subject to change at any time.

****ROUSIX CORE****

Monday - Wednesday

<u>ACTIVITY</u>	<u>TIME (min)</u>	
English/Language Arts (ELA) Lesson Module Segment (LMS) 1	8	
Dreambook	3	
Math LMS 1	8	
College/Career Break	3	
ELA LMS 2	12	65 m
Journal	3	total
Math LMS 2	12	
Vocabulary Boot Camp	5	
ELA LMS 3	4	
Test Talk	3	
Math LMS 3	4	

Thursday

<u>ACTIVITY</u>	<u>TIME (in minutes)</u>	
ELA REVIEW CHALLENGE	10	
Trivia Challenge	5	
Math Review Challenge	10	
College/Career Break	5	
Social Studies LMS 1	2	65 minutes
Puzzle Challenge	5	total
Science LMS 1	2	
Vocabulary Boot Camp	5	
Social Studies LMS 2	8	
Test Talk	5	
Science LMS 2	8	

Weekend Schedule runs from Friday at 12:00 am until Sunday at 11:59 pm

<u>ACTIVITY</u>	<u>TIME (in minutes)</u>	
Assessment	40	
*ELA/Math (15 min ea.)		
*SS/SCI (5 min ea.)		
Enrichment Classes (4 20-minute lessons)	80	
Financial Simulator	45	235 minutes
*Personal Finance (15 min)		total
*Running a Business (15 min)		
*Investing (15 min)		

Research/Lab	60
Standardized Test Practice	10

Holiday activities must be completed between 12:00 a.m. on Monday to 11:59 p.m. the following Sunday.

<u>ACTIVITY</u>	<u>TIME (in minutes)</u>	
Enrichment Classes (4 20-minute lessons)	80	
Financial Simulator (as above)	45	255 minutes
Research/Lab	60	total
Standardized Test Practice	20	
College/Career Workshop	20	
Team Time	30	

****ROUSIX PREP****

<u>Monday - Thursday</u>	<u>TIME (in minutes)</u>	
ELA LMS 1	8	
Dreambook	3	
MATH LMS 1	8	
College/Career Break	3	
Social Studies LMS 1 (M/W)/Science LMS 1 (T/R)	2	
Journal	3	
ELA LMS 2	10	80 minutes
Vocabulary Boot Camp	5	total
MATH LMS 2	10	
Test Talk	3	
Social Studies LMS 2 (M/W)/Science LMS 2 (T/R)	10	
Puzzle Challenge	5	
ELA LMS 3	4	
Trivia Challenge	5	
Math LMS 3	4	

<u>WEEKEND (FRIDAY-SUNDAY)</u>	<u>TIME (in minutes)</u>	
Assessment (ELA/Math/SS/SCI) - 5 min ea.	20	
Enrichment Classes (5 20-minute lessons)	100	
Financial Simulator	45	
*Personal Finance (15 min)		255 minutes
*Running a Business (15 min)		total
*Investing (15 min)		
Research/Lab	80	
Standardized Test Practice	10	

<u>Holiday Schedule</u>	<u>TIME (minutes)</u>	
Enrichment (5 20-minute lessons)	100	
Financial Simulator (as above)	45	285 minutes
Research Lab	80	total
Standardized Test Practice	10	
College/Career Practice	20	
Team Time	30	

F) Components

1) Lesson Modules

Vary by subject and program

****CORE and Prep****

-English/Language Arts (ELA) and Math

Divided into 3 Lesson Module Segments as below

LMS 1: 8 minutes = 45 second to 1 minute background video. Then 45 second to 1 minute explanation of lesson's objectives. Rest of time will be used for direct instruction. During this time, students will be asked 3 questions. These questions must be answered to continue instruction.

LMS 2: 12 minutes (10 minutes in Prep). Student will answer questions. Students must answer a minimum of 15 questions (this number may increase or decrease based on task complexity).

LMS 3: 4 minutes. Will consist of remediation or enrichment. Will utilize nonstandard approaches (such as games or simulations).

-Science & Social Studies

Divided into 2 Lesson Module Segments as below

LMS 1: 2 minutes. 1 minute background video plus 1 minute discussion of lesson objective.

LMS 2: 8 minutes. Direct Instruction. Program will pause so students can answer various types of questions. These questions must be answered before the lesson will continue.

2) ELA and Math Review Challenges

Review Challenges will supplant normal lessons on Thursday in the Core Program. Students will review all previous materials for the year. Questions can come from unmastered goals (80%) and mastered goals (20%). Missing too many questions about a mastered goal will move it back to the unmastered list as well as removing the merit bonus until mastery.

3) Vocabulary Boot Camp

Students will learn vocabulary through the use of self-created digital flashcards. We will utilize a timing model designed to promote maximized learning. Words will be considered mastered when the student correctly identifies it seven consecutive times. When majority of created flashcards have been mastered, students will be able to use part of this time to create new flashcards. Alternatively, students can create flashcards on their own time so that they may maximize their merit bonus.

4) Dream Box

This is a focus tool for long-term goals and/or dreams. Students can collect images of things they want (homes, cars, planes, boats, clothes, etc). Students must categorize their list as well as write a single sentence explaining why they want each item.

5) Journal

Primarily this is a writing log, but we will allow students to dictate their entries. Students can respond to prompts or keep a daily personal journal. Students will dictate their entries in 30 seconds. In the remaining time, they will revise and edit the entry. If extra time remains, students can finish revising older entries or create new entries. Merit bonuses are based on well-written entries (computer will list errors remaining).

6) College/Career Break

Students will be introduced to two colleges and two careers per week. Each days choice will be made in the goal screen prior to starting that days work. The academic task will be to write a brief statement (1-2 sentences) in which the student explains whether he/she would attend the college or take the job and why.

7) Test Talk

Students will be introduced to test construction theory and test-taking strategies. We feel that as students learn more about tests, they will feel more comfortable taking them. The focus will be on standardized testing.

8) Assessment

Each Rousix Core test will last for 40 minutes (15 minutes ea. for ELA and Math and 5 minutes each for Social Studies and Science. In Rousix Prep, assessment will last 20 minutes (5 minutes per subject). Students will be required to answer a minimum number of questions each week and must answer 80% of 100 questions correctly to earn mastery.

9) Enrichment Classes

These allow students to deeply explore subjects of personal interest. Enrichment classes will be drawn from 4 domains: academic, recreational, psychological/cognitive and cultural. Students must complete at least one course from each domain. Courses typically will consist of 8-16 lessons.

10) Research/Lab Projects

Students will complete an assigned number of labs each year based on grade level.

- * K-5: 12 projects per year (each lasts 3 weeks)
- * 6-8: 9 projects per year (each lasts 4 weeks)
- * 9-11: 4 projects per year (each lasts 9 weeks)
- * 12: 3 projects per year (each lasts 12 weeks)

Projects will require students to use skills from all four core subjects.

11) Financial Simulator

Will have three modules:

- A) Personal Finance - Students will be assigned a virtual job each school year. Using this salary, students must create a budget and deal with real world financial issues, including emergencies. Salaries will vary for each student from year to year.
- B) Running a Business - Students will design and/or run a small business. Business models will run across grade bands:

- * K-2: Running a Lemonade Stand
- * 3-5: Running a Toy Store
- * 6-8: Creating and running a business that provides a service
- * 9-12: Creating and running a business that sells a product
(Students must create a product or service)

The student will have to develop a business plan and operate the business efficiently, including adding new lines of product or service.

C) Investment - Students will be given an amount of Rousix Bucks to invest. They will be taught both technical and fundamental investing tools. They will have access to real world numbers. We will limit investment vehicles for younger grades, but by grade 8, all investment options will be available, including collectibles.

12) Standardized Test Practice

Students will answer questions based on SAT critical reading or math skills. This will allow students to become familiar with SAT question types from early grades.

13) Puzzle Challenge

Students will work on a puzzle during this time. Activities can include jigsaw puzzles, mazes, word games or number games.

14) Trivia Challenge

Students have to answer as many trivia questions as possible. High scores will be eligible to win a prize drawing each Thursday.

15) College/Career Workshop

Students will practice skills necessary to go to college or get a job. Skills will include selecting a college or career, selecting a major, finding and applying for scholarships, and the application process.

16) Team Time

This must be completed in one setting each time. Students will be assigned to a team from geographically diverse areas. Projects will require students to share information about the project. Projects may include local area information or discussions of current events. Teams will consist of 4 to 6 students.

G) Incentive and Merit Bonuses

Incentives will vary based on grade band.

GRADE BAND	INCENTIVE
K-2	\$200
3-5	\$400
6-8	\$800
9-11	\$1200
12	\$1600

Merit Bonuses will be paid as follows:

ACTIVITY	BONUS
100% Goal Mastery	\$100
Vocabulary Boot Camp (per 10 words learned)	\$0.10
Dream Book (per entry)	\$0.10
Journal (per fully edited entry)	\$0.25
Enrichment (per course completed)	\$10
Assessment Protocol (per week)	
70-79	\$1
80-89	\$3
90-99	\$5
100	\$10
Financial Simulator (\$1500 Maximum bonus)	1/10,000 net
College/Career Workshop (per module)	\$3
Team Time (4 projects)	\$5/project
Graduation Bonus (seniors) prorated @ \$385/year in program	\$2000
10 correct answers in a row	\$0.50
Research/Labs	
- K-5 (\$5/lab; 12 labs)	\$60
- 6-8 (\$10/lab; 9 labs)	\$90
- 9-11 (\$30/lab; 4 labs)	\$120
- 12 (\$50/lab; 3 labs)	\$150
Puzzle Challenge	\$0.25/puzzle
Trivia Challenge	\$.05/right ans.

Average Student

K-5 Core 6-8 Core 6-8 Prep 9-11 Core/Prep 12Core/Prep

Bonus	Task/Bonus/Task/Bonus/Task/Bonus/Task/Bonus/Task/Bonus						
100% Goal Mastery							
Vocabulary Boot Camp							
Dream Book							
Journal							
Enrichment Classes							
Assessment							
Financial Simulator							
*Personal Finance							
*Business							
*Investment							
College/Career Workshop							
Team Time!							
Graduation Bonus							
10 In a Row							
Research Labs							
Trivia Challenge							
TOTAL	\$640	\$675	\$775	\$700	\$800	\$2750	\$2850

Total Expenditures per Student per Year

GRADE BAND	INCENTIVE	MERIT BONUS	TOTAL
K-2	\$200	\$640	\$840
3-5	\$400	\$640	\$1040
6-8 Core	\$800	\$675	\$1475
6-8 Prep	\$800	\$775	\$1575
9-11 Core	\$1200	\$700	\$1900
9-11 Prep	\$1200	\$800	\$2000
12 Core	\$1600	\$2750	\$4350
12 Prep	\$1600	\$2850	\$4450

Program Overview

Merit Bonus

+

Grade Fees Operations Incentives Enrollment Bonus Total Exp Total Rev/Stu

K	\$2500	\$500	\$840	\$150	\$1490	\$1010
1	\$2500	\$500	\$840	\$150	\$1490	\$1010
2	\$2500	\$500	\$840	\$150	\$1490	\$1010
3	\$2500	\$500	\$1040	\$150	\$1690	\$ 810
4	\$2500	\$500	\$1040	\$150	\$1690	\$ 810
5	\$2500	\$500	\$1040	\$150	\$1690	\$ 810
6	\$2500	\$500	\$1525	\$150	\$2175	\$ 325
7	\$2500	\$500	\$1525	\$150	\$2175	\$ 325
8	\$2500	\$500	\$1525	\$150	\$2175	\$ 325
9	\$2500	\$500	\$1950	\$150	\$2600	\$(100)
10	\$2500	\$500	\$1950	\$150	\$2600	\$(100)
11	\$2500	\$500	\$1950	\$150	\$2600	\$(100)
12	\$2500	\$500	\$4400	\$150	\$5500	\$(2550)
Total	\$32500	\$6500	\$20465	\$1915	\$28915	\$(3585)

Rousix Enrollment

A) Objective

Rousix Enrollment will enable us to better understand each student's needs and provide a foundation for beginning the new year

B) Program Overview

Students will have 31 days to complete 16 hours of material. Enrollment material is composed of diagnostic tools, academic and cultural development tools, and preparatory tools. Enrollment is only available to Rousix Core and Prep students.

C) Anticipated Launch Date - August 2021

D) Fee

Free to Rousix Students. \$150 for anyone who wants to analyze academic ability.

E) Calendar

Students must complete 17 hours (1020 minutes) between August 1 to 31 each year

<u>MODULE</u>	<u>TIME (in minutes)</u>	
Registration	30	
Pre-Assessment	60	
Academic Assessment	120	
Writing Sample	60	1020 minutes
Interest Inventory	30	total
Critical Thinking Class	180	
Cultural Literacy Class	240	
Flashcard Creation	120	

Enrollment Rules

* After 60 minutes on any single module the program will exit. That module cannot be re-opened for 15 minutes. Students can choose to work on a different module if one is available.

* Pre-Assessment will not be available until the academic assessment is completed.

F) Components

1) Registration

Students will ensure that demographic information is correct, watch an introductory video, and read/sign a Rousix contract.

2) Pre-Assessment

Students will be tested on the curriculum for the coming year with 15-minute tests in English/Language Arts, Math, Social Studies, & Science.

Rousix believes that pre-testing is useful because (1) it helps the student learn what concepts are important; (2) it teaches students what they don't know; and (3) show what areas need extra work.

3) Academic Assessment

This will test the student's mastery over the materials from previous academic years. This will help us determine where students may need remediation and allow us to set the beginning academic level for the year. It will consist of 4 30-minute tests in English/Language Arts, Math, Social Studies, and Science.

4) Writing Sample

The student will complete a writing sample following a standard writing process.

- 1). Pre-Writing
- 2). Drafting
- 3). Revision and Editing
- 4). Publishing

The writing sample will be assigned as follows:

- *K: Story (will be done orally)
- *1: Expository (will be done orally)
- *2: Story
- *3: Personal Reflection Essay
- *4: Expository
- *5: Persuasive
- *6: Story
- *7: Personal Reflection
- *8: Expository
- *9: Story
- *10: Expository
- *11: Persuasive
- *12: Critical Analysis

5) Interest Inventory

This will help us learn student interests. This will help our interactive tutor to help meet student needs and will provide direction of assigning materials. We will also give the student a Lexile test to determine reading level.

6) Critical Thinking Enrichment Course

This course will be composed of twelve 15-minute lessons. We believe that critical thinking is an important skill, but often ignored. We want to expose students to advanced critical thinking skills as part of our goal to produce productive citizens who are able to ask and answer questions about vital issues facing their community. We

will introduce students to claims and warrants, formal logic (deductive and inductive), fallacies, as well as other critical thinking tasks.

7) Cultural Literacy Enrichment Course

This course is composed of 12 15-minute lessons. It will expose students to Western Culture. Grades will cover topics as follows:

- *K: Performance
- *1: Music
- *2: Art
- *3: Architecture
- *4: Performance
- *5: Music
- *6: Art
- *7: Architecture
- *8: Performance
- *9: Music
- *10: Art
- *11: Architecture
- *12: Contemporary Culture

Performance Arts will include discussions of movies, television, and the stage. Students will see clips of important scenes and, in some cases, entire television episodes.

In music, students will be exposed to classical music and opera as well as dance, both ballet and modern interpretive.

Art will include lessons in painting, sculpture, drawings, and other art mediums.

Architecture will study buildings as well as design techniques.

8) Focus on the Core Enrichment Course

This course will consist of 16 15-minute sessions. It will consist of an in-depth focus on each of the four core subjects: ELA, Math, Social Studies, Science. Each subject will be covered in four 15-minute courses.

The subjects will change from year to year in some cases, but the following will be a general guideline:

*K

- ELA: The Alphabet
- M: Arabic Numerals
- SCI: The Scientific Method
- SS: Government Who's Who.

*1

- ELA: Recognizing Allusion: Fairy Tales, Fables, Legends
- M: Math Tricks
- SCI: Galileo
- SS: George Washington

*2

- ELA: Alphabets: Ours & Others
- M: Math secrets
- SCI: Copernicus
- SS: Abraham Lincoln

*3

- ELA: Recognizing Symbols
- M: Mental Math
- SCI: Stephen Hawking
- SS: Franklin Delano Roosevelt

*4

- ELA: Recognizing Allusion: Myth
- M: Math Tricks
- SCI: Newton
- SS: Genghis Khan

*5

- ELA: Recognizing Symbols
- M: Roman Numerals
- SCI: Charles Darwin
- SS: Attila the Hun

*6

- ELA: Recognizing Irony
- M: Math Tricks
- SCI: Albert Einstein
- SS: Caesar Augustus

*7

- ELA: Recognizing Allusion: Myth
- M: The Fibonacci Sequence
- SCI: The Earth
- SS: Adolph Hitler

*8

- ELA: Recognizing Symbol
- M: The Number System
- SCI: The Solar System & Beyond
- SS: Joseph Stalin

*9

- ELA: Recognizing Irony
- M: The Golden Mean
- SCI: Evolution
- SS: The American Revolution

*10

- ELA: Recognizing Allusion: The Bible
- M: Math Tricks
- SCI: Newtonian Physics
- SS: The American Civil War

*11

- ELA: Recognizing Symbol
- M: Topics in Contemporary Mathematics
- SCI: Einsteinian Physics
- SS: World War I

*12

- ELA: Recognizing Irony and Ambiguity
- M: Topics in Contemporary Math
- SCI: Quantum Physics
- SS: World War 2

9) Flashcard Creator

Students will make digital flashcards for vocab Boot Camp. Each card will have a word on one side and a definition on the other. On the side with the definition, the student will add the following:

- * upper left corner: Part of Speech of Word
- * lower left corner: A sentence using the word
- * upper right corner: A synonym and antonym
- * lower right corner: A drawing that represents the word to the student. The drawing must be completed by the student using drawing tools; no pre-created images.

G) Incentive: \$150/student

3) Rousix Summer Camps

A) Objective

Summer camps will enable students to have a chance to build on their interests in a hands on manner.

B) Overview

Students will complete hands on projects or gain a deeper understanding of topics of interest. All students will receive needed materials prior to the first day of camp.

C) Projected Launch Date: June 2022

D) Calendar

Summer camps will last for 15 days each. Students will be able to sign up for 3 camps (45 total days).

Students will be able to choose between five session times:

- * Session 1: 7:00 am - 10:00 am
- * Session 2: 10:30 am - 1:30 pm
- * Session 3: 2:00 pm - 5:00 pm
- * Session 4: 5:30 pm - 8:30 pm
- * Session 5: 7:30 pm - 10:30 pm

Once a session has been chosen you must meet within that time block. Camps meet Monday - Friday, except for Independence Day.

E) Fee: \$750/camp

F) Components

Each summer camp will produce something related to the topic of that camp. They may produce real items, drawings, videos, white papers, etc. Camps will feature both group and individual work.

G) Incentives

- * All students will receive materials necessary for camp: \$250
- * A physical item related to the subject of the camp: \$250
- * All students who enroll in three camps during a summer will receive an all-expense paid trip for him or her and up to 4 family members. The trip will be 3 days/4 nights and will be related to the subject of the camp. Students will have a choice of three camps: \$5000

4) Rousix SOS

- A) Objective
Rousix SOS is an intensive SAT/ACT test preparation program
- B) Overview
This program is designed to prepare students to pass college entrance exams (esp. the SAT). This program will be available in summer for high school students. No other summer programming can be utilized with this course.
- C) Projected Launch Date: June 2024
- D) Fee: \$1500
- E) Calendar

The program will run 45 calendar days from June 1 to July 16 (excluding Independence Day). Students will be expected to meet Monday - Saturday.

DAILY SCHEDULE

Monday - Wednesday	Time (in minutes)	
SAT Critical Reading Skills	20	
Game Break 1	5	
SAT Math Skills	20	70 min
Game Break 2	5	
SAT Writing Skills	20	
Thursday		
Writing Test 1 (Essay)	25	
Critical Reading Test 1	25	75 min
Math Test 1	25	
Friday		
Critical Reading Test 2	25	
Math Test 2	25	75 min
Writing Test 2	25	
Saturday		
Math Test 3	20	
Writing Test 3	10	75 min
Critical Reading Test 3	20	
Test Analysis	25	

F) Components

- 1) SAT_____Skills
Students will focus on SAT skills that the practice tests show are most needed. Days 1-3 will consist of basic skills practice.
- 2) Game Breaks
Students will have a random game loaded that will include a focus on SAT skills.
- 3) Practice Tests
Each Thursday - Saturday, students will take a complete SAT practice test. The test results will determine skill sets for the next week.
- 4) Test Analysis

Students will have a comprehensive in-depth analysis of their practice test.

G) Incentives

\$1500 fee will be refunded if student passes the SAT or ACT plus students will be given a bonus \$1 for each point on their combined score (to \$2400).

5) Rousix Book Club

A) Objective

To produce better readers across all grade levels.

B) Overview

This will be our primary independent reading outreach. We will encourage students to enroll, but it will not be required. Students must read books at their appropriate grade level and complete reading logs and projects for each book. We will not give objective tests as a part of this program, but students must achieve mastery of all activities before the book is completed.

C) Projected Launch Date: January 2022

D) Fee: Free for Core/Prep students; fee based for all others (\$9.95/month).

E) Calendar

Will be available year-round.

F) Components

1) Books

Licensed books from a wide variety of publishers. We would like to offer around 100 million titles ultimately. Books will consist of both literacy and popular fiction.

2) Projects/Logs

The reading log will automatically update as students read. It will show a student his/her session statistics (pages read; % of assignment completed, etc.). It will also maintain historical stats on

both an annual and lifetime basis. Students will also be able to view old projects. We will run all projects assignments through a plagiarism database that will include Rousix Reading Projects.

Projects will consist of a series of graphic organizers and short worksheets (3 to 5 questions about important skills from assigned task. Each book will be divided into 5 sections, and students must complete two end of book activities.

(1) Complete a chart in which they list literacy elements including plot, characteristics, setting, point of view, figurative language, and others depending on grade level. They will also have to write at least 1 theme of the work.

(2) Students will write a short (50-100 word) review to either recommend the book or not.

3) Author Chats

We will invite authors to conduct digital chats with students. These events will be interactive, so students can ask questions. Old sessions will be archived.

4) Book Clubs

Students can join either temporary or permanent book clubs.

(1) Temporary book clubs can be formed by any group (2nd or greater). Students can discuss the book as desired.

(2) Permanent book clubs can be established by friends or by groups of students who share similar interests. These readers must be of a similar reading level as they will choose books as a group. Rousix will facilitate these clubs by allowing students to search for compatible members.

Rule for Clubs

(1) Core and Prep students can only join clubs composed of core and prep students. Other members will not be allowed to join student clubs.

(2) Each group member will have separate activities.

(3) No one may sign on to a club while working on a project activity.

G) Incentives

Incentives will be both by book as well as goal based.

* When students finish a book, they will be able to download 5 digital songs, 3 television episodes, or a movie. Alternatively, they can also order a hard copy of the book. Approximately \$5 incentive.

* Goal based incentives will require the students pledge to complete a specific number of books and projects.

FINISHED PROJECTS	INCENTIVE	COST Per 100 Books
5	\$10	\$200
10	\$25	\$250
25	\$50	\$200
50	\$100	\$200
75	\$250	\$250
100	\$500	\$500

6) Rousix 13th Grade

A) Objective

13th grade will help members excel in college and belong to foster a sense of the importance of lifelong learning.

B) Objective

This program will help members succeed at the college level as well as providing learning tools to communities that want to learn. They will be able to access many Rousix tools, and we will create options for adult learners.

C) Projected Launch Date: January 2026

D) Fee: \$29.95/month or \$300/year

E) Calendar

Will be available year-round.

F) Components

- * Access to daily core lessons in core subjects
- * Access to Rousix Financial Simulator
- * Access to Rousix virtual labs and research library
- * Non student access to Rousix Lounge
- * Access to Enrichment Courses
- * Access to Rousix Studio
- * Access to standardized testing material (most educational and professional exams).

1) Job Training

We will maintain a library of courses to help members improve their job skills.

2) Vocational Training

Courses that will teach students skills necessary for vocational certification.

3) Rousix U

Take classes from and receive your degree online from our partnered universities. Members will receive significant tuition discounts.

G) Incentives

- * Free months (for engaging in certain activities)
- * Daily contest drawings

7) Rousix RPG

A) Objective

Teach problem-solving skills, critical thinking and academic skills.

B) Overview

The RPG will be an immersive interactive game experience. Members will enter into a world composed of modules drawn from history, art, and literature. They will solve mini-modules as they advance to completing a module (100 mini-modules).

C) Projected Launch Date: January 2028

D) Fee: \$9.95/month

E) Calendar

Will be available year-round except for quarterly overnight updates.

F) Components

Students can play the game alone or with friends. Students will create an avatar using the Rousix app and will choose a class description among kid-types (Jock, Brain, Cheerleader, Skater, etc.). Each class will have its own skills and abilities.

Modules include settings from history, art or literature. Players will meet appropriate.

NPC (non-player character) guides who are appropriate to the setting

G) Incentives

- * Finish minimodule (30-60 minutes) - 1 music download
- * Finish 10 minimodules (5-10 hours) - 1 movie download
- * Finish 1 module (100 minimodules; 50-100 hours) - Feeding Frenzy

- * All applicable awards are given. For each module, students receive 100 song downloads, 10 movie downloads, and 1 Feeding Frenzy.

- * Feeding Frenzy is a virtual gift card (\$2500) to a popular chain restaurant chosen by the student

8) Rousix Sims

A) Objective

Help members develop problem-solving and critical thinking skills

B) Overview

We will develop 4 simulations that will feature intuitive immersive game play. New simulations will be added periodically.

C) Projected Launch Date: January 2023

D) Fee: \$9.95/month

E) Calendar

Will be available year-round.

F) Components

1) Rousix Zoo

Players will develop a zoo. Animals will become more exotic and require more substantial exhibits as the player improves his/her zoo. Goals will include attendance figures as well as acquisition of animals and attractions.

2) Rousix Amusement Park

Players will develop an amusement park. Students can acquire rides/attractions or design their own. Goals will include attendance figures and acquisitions. Some goals will require students to develop safe rides and/or attractions.

3) Rousix War Sim

Players can compete in many historical wars and battles from Marathon and Operation Iraqi Freedom. Players can play solo against the computer or against one or more human players. Goals will include meeting certain objectives based on historic fact.

4) Rousix Universe

Players will develop a planet from colonization to interstellar. This will help students understand the scope of history. Goals in the game will be tied to population, cultural/scientific level, diplomacy, etc.)

* Simulation complexity will increase as the student gets older:

- Kindergarten
- 1st - 6th grades
- 7th - 12th grades
- Post High School

* Rousix Core and Prep members will be assigned to their grade level. All others will be put in Post High School Group.

G) Incentive

- * Complete 25 goals: 1 music download (about 1 hour)
- * Complete 100 goals: 1 movie download (about 100 hours)
- * Complete 250 goals: Feeding Frenzy (about 250 hours)

9) Rousix School

A) Objective

Will provide competitive full-curriculum software to schools.

B) Overview

We will offer 3 products in this line: a summer school program, a charter school program and a supplemental classroom program. It can be used to make up classes or as an accelerated graduate program. The supplemental classroom program will offer teachers Rousix educational solutions and tools.

C) Anticipated Launch Date: August 2030

D) Fee

- * Summer School: \$750/course taken
- * Charter School: \$5500/student/year
- * Supplemental Classroom: \$7/student/year

Grants-in-aid will be available to qualifying school districts.

E) Calendar

Components will be available as schools need them

F) Components

- 1) Summer School - will offer accelerated classes (class can be completed with 2 hours work/day for 40 days).
- 2) Charter School - will offer fully accredited courses for graduation for grades 9-12. Most courses can be completed in 2-3 months.
- 3) Supplemental Classroom - will give schools access to many Rousix educational tools including our virtual lab and research library.

Teachers will be able to select lessons designed by Rousix experts to help teach their state curriculum.

G) Incentives

* None for summer school of charter school

* Supplemental Classroom as below

Rousix Teacher of the Year

- 3 given each year: Grades k-5, Grades 6-8, and Grades 9-12
- Teacher receives \$10,000 and a trip for them and their families that will be chosen by the teacher
- Winning schools will receive a year end pizza party

Rousix Schools of the Year

- 15 given (5 at grades k-5, 5 at grades 6-8, and 5 at grades 9-12)
- Schools will receive a \$10,000 grant
- Schools will receive a year end pizza party
- Each school employee (principals, counselors, teachers, aides, etc.) will receive a \$500 bonus

10) Rousix Educational Centers

A) Objective

Will provide full service educational and virtual reality opportunities

B) Overview

We will provide a wide variety of educational opportunities from pre-school to after-hours and evening programs to summer programs.

C) Projected Launch Date: June 2035

D) Fees: Will vary from region to region. Rousix will charge franchisees 12.5% of revenues. Rousix will build education centers, but operations will be franchised. Franchisees will pay rent on the building.

E) Calendar

Services will be offered year around. Academic offerings will be at franchisee's discretion.

F) Components

- * Preschool
- * After-school programs
- * Night Programs
- * GED Programs
- * Vocational Programs
- * Saturday Programs
- * Virtual Reality Centers

Note: All services may not be available at all locations.

G) Incentives

None for educational centers, but students can work on other Rousix programs from the Centers.

11) Rousix Vocational

A) Objective

Will prepare students for vocational licensing.

B) Overview

This program will enable students to prepare for jobs that require certification, but do not require college. Coursework can be completed online or at Rousix Education Centers.

C) Projected Launch Date: June 2035

D) Fees: Generally, students will be charged \$50 for each hour in certification, but do not require college. Coursework can be completed online or at Rousix Education Centers.

E) Calendar

We will offer new course starting times 8 times during the year (roughly once every six weeks).

F) Components

1) Certification Classes

These classes will be offered online using Rousix teaching methods. Members can work independently or join classes at Rousix Educational Centers.

2) Apprenticeship Programs

We will gather large numbers of experts to provide our members with on-the-job training in the real skills they are practicing in the class. We feel that our members will be better served with a combination of classroom instruction and real-world practice. Moreover, it gives members a chance to make some money while gaining their new skill.

As the program develops, we will acquire a large number of master craftsmen who should be willing to train others as they were trained.

G) Incentives

This program is not incentive based; however, we will pay our mentor craftsmen a stipend of \$2500 each time they take on a student.

Section 3: Ancillary Education Resources

1) Student (Member) Page

All members across the platform will be able to access this page. It will serve as a primary information source as well as a gateway to all of Rousix's line of educational applications.

This page will maintain a complete statistical record of site activity. Anything we save for member viewing will be here. It will serve as a collection of all metrics collated to determine member achievement, both historically and in the present. The member will see visual record of his/her improvement over time. We will provide daily snap shots of performance as well as an archive that will include assignments; journal entries; dreambook entries; financial simulator info; mastered vocabulary words; suggested careers; college planning; independent or assigned work in labs, studies or research desk, and many others.

We will also compile information from all other Rousix models here as well as information about incentives. The site will always display the member's current goal, current assignment, current incentive total, and your next incentive payout date (all updated in real time). This will also serve as the portal to the complete Rousix world of educational applications.

2) Interactive Digital Peer Tutor

Rousix will allow students to select a vernacularly-appropriate digital tutor. We believe that this will allow students to feel more comfortable during instructional time. The interactive peer tutor will be more than

just an instructor. He will be the student's collaborator in the education process. He will guide the student to follow procedures, help ensure that projects and assignments run smooth, and suggests areas the student needs to focus on. The digital tutor will be able to provide supplemental information about a topic (or tell the student how to find it. The tutor can also recommend books, movies, television shows, or goal ideas. Digital tutors will only be available to Core, Prep, and 13th grade students.

3) Avatars

Members will create an avatar to represent themselves inside Rousix. Students will upload a picture of themselves, and we will create a digitalized version of them. This version will be customizable in terms of appearance, clothing, and accessories.

Keep in mind, we want these images to be self-affirming. If students gain confidence through their avatar, we believe it will carry over into the world.

4) Student Savings Accounts

Just because students generate money within the program, it doesn't mean they have to spend it. We will allow students to establish saving accounts in the Rousix Community Bank. Students earn interest on their savings and, in years that they increase their savings by 10%, they can earn a bonus. While any Rousix members can open an account, only Core and Prep students qualify for end-of-year savings bonuses.

At the age of 13, we will issue our members debit cards (if they apply for them), so that they can have immediate access to real money. No Rousix members will be allowed to overdraft. Insufficient funds will result in denial of transactions. Younger students can access their available funds online (with parent approval).

For our high school students, Rousix would like to help teens with their first major purchase: a car. In this program, the Rousix Community Bank will extend a loan of up to 10x their current balance in the bank. To qualify for this loan, students must (1) have a minimum current balance of \$2000 in their account and (2) have a 3-year history of quarterly deposits. As this is a loan, payments must be made (We reserve the right to impose conditions of possible loan forgiveness). The loans will be interest-free so long as two conditions are met:

- A) Student makes loan repayments as scheduled
- B) Student continues to meet current educational goals.

If these conditions are not met, interest may be charged at prime plus no more than 50 points. Ultimately, the Rousix Community Bank will be self-sustaining. We will invest customer funds in safe overnight investments, and will pay operation costs and bonuses, and make loans out of these funds.

5) Goals

The goals module allows students to choose what they want to learn that day. At the beginning of the year, students will work through each comprehensive goal in ELA and Math (Social Studies and Science goals will be a little different as they will work in bands) in order. Within these comprehensive goals, they can choose order of presentation of subskills.

After doing each subskill once, students will be able to select the comprehensive goal they wish to work on for the day until all subskills are mastered (75-100 days on average). Multiple subskills can be worked on in the same lesson.

While working toward mastery, student comprehension will be closely monitored. Skill sessions (for Core students) can be used to complete mastery. Mastery will only be awarded when 2 conditions are met.

- 1) Student completes 3 consecutive assignments that focus on subskill at a mastery level of 80% or higher.
- 2) Assessment levels of 100 post-initial exposure subskill questions at 80%.

Note: For students in Kindergarten through grade 3, ELA Comprehension Skill 1: Beginning Reading must be mastered before moving to other comprehension skills.

6) Voting

We believe that voting is an essential part of good citizenship. We want to give students ample opportunities to practice this skill.

Students will have three ways to practice voting:

1) Mock Elections.

Students will be given real ballots that look the same as local ballots. Students must read age-appropriate Project Vote Smart summons before voting. Students will earn entry into a contest drawing when they vote.

For students age 18 or older, they will be entered into a special drawing for registering to vote. We will encourage our members to vote and will supply educational materials about candidates. Some elected officials or those running for office will be invited to appear in the Rousix Lounge for a virtual town hall.

2) We will hold special student votes on topics of importance to Rousix operational changes and similar matters.

3) We will offer snap polls about topics of importance to society or within Rousix. If a student lab needs a survey, we will allow all students to submit up to five questions. We will update this poll throughout the site.

All election data will be available in the research library for student use.

7) Virtual Lab

The Rousix Virtual Lab will replicate the tools found in modern state-of-the-art labs. It will be used to conduct research into the hard sciences, the social sciences, mathematics, and languages. We will offer a statistics compiler, database of language, survey tools, and lab apparatus. We want to include simulations of cutting-edge science tools with simplified interfaces (such as CRISPR).

We believe that all students should have access to a world-class lab, even if realities of cost dictate that it be virtual. Members will be able to utilize the lab outside of assignments to pursue their personal interests.

8) Research Desk

This is a companion to the lab. We will provide tools to help members research, plan, and create projects. The research desk will consist of several components.

- A) Access to full-text newspaper, magazines, and journal databases (Ebsco, Lexus-Nexus, Gale, etc.)
- B) Access to online book collections.

- C) Writing tools to help with brainstorming, planning, documentation, and publication tools.
- D) Access to a presentation creation application (PowerPoint).
- E) Drafting and 3-D Rendering programs. We will offer a 3-D printing service so students can opt to purchase a real prototype of their item.

9) Virtual Studio

The virtual studio will be a place for members to practice their creative natures. There will be four components in the studio:

A) Art Studio

Members can let their inner artist out. We will have tools for drawing, painting, and other forms (such as collage). Students will be able to create works using a variety of media: oils, charcoal, acrylics, pencil, watercolor, etc. We will offer a 3-D virtual space for sculpture.

B) Music Studio

Members can live out their musical dreams with this full-featured recording and editing studio. We will give students access to songwriting tools, instrument modelers, and other tools.

C) Film Studio

Members can exercise their inner Hitchcock. Film can be shot using a tablet, phone, or students can use incentives to buy high quality digital cameras.

D) Photo Studio

Students can edit and manipulate photos taken with their phone, tablet, or other camera. The studio will be accessed as part of some enrichment classes. All members may use these modules on their own time.

We will provide ample tutorials given by experts in their field to make getting started easier. Periodically, we will sponsor contests for items created by using Rousix Studio.

10) Educational Tools

We believe that children should have access to quality tools that make educational tasks easier. These tools will be used across the curriculum as needed as well as being available if the student needs to use them outside of academic tasks.

We will offer rulers, calculators, scales, time-line makers, graphic organizers, and other tools. We will create an app that uses the phone or tablet to help make real measurements.

11) Rousix Lounge

The Lounge will be our primary online hangout. Student safety will always be our number one goal, so the student lounge will be kept separate from the general member lounge. The lounge will be a place where members can go for help and/or conversation. Current experts (students who have mastered a goal) will be eligible to answer questions about that goal about the topic in question. General knowledge questions can be answered by anyone.

The Lounge will also feature virtual meet-and-greet sessions with VIPs from the world of film, music, theatre, business or government.

12) The Hall of Fame

Rousix believes in celebrating student achievement. The Hall of Fame will be one of our primary methods to do so. The program requires the creation of lots of projects. The best will be placed in the Hall of Fame on a daily basis. Moreover, daily, we will hold Special drawings consisting only of students who had Hall of Fame entries that day.

13) Virtual Reality

Rousix VR is a long-term goal. Eventually, we would like our entire platform to be VR. We want students to attend digital classes, interact with "real" versions of their interactive peer tutors as well as with avatars of their friends or to "physically" enter a digital lab or studio. We believe that student interest will build in a realistic and immersive environment, and it will lead to higher levels of achievement.

14) Fireworks Page

Whenever students answer a question correctly or meet a program goal, they will be offered a choice of one of two to three fireworks. More complex tasks, result in more complex fireworks. In firework shows, students can put earned fireworks into a chosen order and watch their shows. Earned fireworks can be saved and viewed on the member page.

15) Parents Page

The Parents Page is how we will interact with parents of our students. Parents will have full access to their children's past and current performance. For students under 18, parents can monitor and/or approve their child's use of incentive funds

We will also offer special programming for parents, including an Educationese-to-English translator. We will also offer plain English translations of educational documents.

UNIT III: Financial Information

1. Initial Financial Costs

This will be an expensive launch.

Initial programming and development expenses will cost about \$20 million and could exceed \$50 million. R&D could add an additional \$20-30 million. Thus, to acquire usage rights and design and implement the program will cost between \$40-80 million.

In addition, we will need money in year 1 to pay for 9000 initial students (see charts for financial forecasts).

2. Controlled Growth Strategy

In years 1-5, we will use a strategy that limits growth while encouraging growth from lower grades (see charts).

TBD.

3. Potential Revenue Issues

As with any business, some trap falls could await.

First, we must sustain at least 70% of total student capacity in grades k-5. As these grades pay for a bulk of the program. We also need to ensure that advertising revenue remains consistent.

Our public-private financing model will need to be closely maintained. At least one-half of our annual gross revenue should be donated to Mining the Minds of America's Youth (MMAY). This percentage may be larger in our early years.

4. Public-Private Revenue Model

Our 501C.3 entity, Mining the Minds of America's Youth (MMAY) will take donations from individuals, corporations, and other nonprofits. These funds will be used to pay student fees into the program. Rousix will also donate a substantial portion of gross revenue to MMAY.

5. Revenue Streams

First, we will not mine and sell member data, whether child or adult. We feel that the loss of good will from these transactions would be greater than any income accrued. No gathered information will ever be sold. Anonymous student data may be provided freely to educational researchers.

We will rely on two sources of income:

- 1) Student Fees
- 2) Advertising Revenue

6. Ad Revenue

* Rousix Enrollment

- 17 30-second ads @ \$0.25/user
- Banner Ads: 2040 30-second blocks @ \$0.11/user

* Rousix Core

- 1 30-second ad x 224 days @ \$0.25/user
- Banner Ads
 - * M - T: 120 30-sec blocks x 144 days @ \$0.07/user
 - * WEEKEND: 450 30-sec blocks x 36 weekends @ \$0.11/user
 - * Holidays: 470 30-sec blocks x 4 holiday weeks @ \$0.15/user

* Rousix Prep

- 1 30 second ad x 224 days @ \$0.25/user
- Banner Ads
 - * M - T: 160 30-sec blocks x 144 days @ \$0.07/user
 - * Weekend: 510 30-sec blocks x 36 weekends @ \$0.11/user
 - * Holidays: 570 30-sec blocks x 4 holiday weeks @ \$0.15/user

* Rousix Summer Camps

- 360 30-second blocks over 45 days for 3 sets of 5 sessions @ \$0.03/user

* Rousix SOS

-Banner: 245 30-second blocks x 45 days @ \$0.07/user

*Rousix 13th Grade

- Banner: 245 30-second blocks x 45 days @ \$0.07/user

*Rousix RPG/SIMS

- 1 minute load-in ad @ \$0.25/user

- Banner: 240 30-sec blocks per day x 320 days @ \$0.07/user

* Rousix Book Club

- Book Sponsorship: \$10 per book

- Banner: 240 30-second x 320 days @ \$0.07/student

Appendix 1: SAT Goals

Test Breakdown

<u>TEST</u>	<u>NO. QUESTIONS</u>	<u>TIME (minutes)</u>
Critical Reading 1	24	25
Critical Reading 2	24	25
Critical Reading 3	10	20
Math 1	18	25
Math 2	20	25
Math 3	16	20
Writing 1	35	25
Writing 2	14	10
Essay	N.A.	25

Critical Reading Skills

1) Sentence Completion

- * Vocabulary in Context Questions
- * Logic-Based Questions

2) Passage-Based Reading

- * Passage Length: 100-850 words
 - Single Source and paired pieces (issue or theme)
 - Topics: Humanities, social studies, natural sciences, and literary fiction
 - Vary in style and tone (narrative, persuasive, expository, literary)
- * Extended Reasoning
- * Facts, Assumptions, and inferences
- * Logic, style, and tone
- * Literal Comprehension

Writing Skills

Scoring

- Essay: 2-12 30% of grade
- Writing Skills m/c: 20 - 80; 70% of grade

Exhibit 9.1 SAT Scoring Guide

Score of 6

An essay in this category is *outstanding*, demonstrating *clear and consistent mastery*, although it may have a few minor errors. A typical essay

- effectively and insightfully develops a point of view on the issue and demonstrates outstanding critical thinking, using clearly appropriate examples, reasons, and other evidence to support its position
- is well organized and clearly focused, demonstrating clear coherence and smooth progression of ideas
- exhibits skillful use of language, using a varied, accurate, and apt vocabulary
- demonstrates meaningful variety in sentence structure
- is free of most errors in grammar, usage, and mechanics

Score of 5

An essay in this category is *effective*, demonstrating *reasonably consistent mastery*, although it will have occasional errors or lapses in quality. A typical essay

- effectively develops a point of view on the issue and demonstrates strong critical thinking, generally using appropriate examples, reasons, and other evidence to support its position
- is well organized and focused, demonstrating coherence and progression of ideas
- exhibits facility in the use of language, using appropriate vocabulary
- demonstrates variety in sentence structure
- is generally free of most errors in grammar, usage, and mechanics

Score of 4

An essay in this category is *competent*, demonstrating *adequate mastery*, although it will have lapses in quality. A typical essay

- develops a point of view on the issue and demonstrates competent critical thinking, using adequate examples, reasons, and other evidence to support its position
- is generally organized and focused, demonstrating some coherence and progression of ideas
- exhibits adequate but inconsistent facility in the use of language, using generally appropriate vocabulary
- demonstrates some variety in sentence structure
- has some errors in grammar, usage, and mechanics

Score of 3

An essay in this category is *inadequate*, but demonstrates *developing mastery*, and is marked by ONE OR MORE of the following weaknesses:

- develops a point of view on the issue, demonstrating some critical thinking, may do so inconsistently or use inadequate examples, reasons, or other evidence to support its position
- is limited in its organization or focus, or may demonstrate some lapses in coherence or progression of ideas
- displays developing facility in the use of language, but sometimes uses weak vocabulary or inappropriate word choice
- lacks variety or demonstrates problems in sentence structure
- contains an accumulation of errors in grammar, usage, and mechanics

Score of 2

An essay in this category is *seriously limited*, demonstrating *little mastery*, and is flawed by ONE OR MORE of the following weaknesses:

- develops a point of view on the issue that is vague or seriously limited, demonstrating weak critical thinking, providing inappropriate or insufficient examples, reasons, or other evidence to support its position
- is poorly organized and/or focused, or demonstrates serious problems with coherence or progression of ideas
- displays very little facility in the use of language, using very limited vocabulary or incorrect word choice
- demonstrates frequent problems in sentence structure
- contains errors in grammar, usage, and mechanics so serious that meaning is somewhat obscured

Score of 1

An essay in this category is *fundamentally lacking*, demonstrating *very little or no mastery*, and is severely flawed by ONE OR MORE of the following weaknesses:

- develops no viable point of view on the issue, or provides little or no evidence to support its position
- is disorganized or unfocused, resulting in a disjointed or incoherent essay
- displays fundamental errors in vocabulary
- demonstrates severe flaws in sentence structure
- contains pervasive errors in grammar, usage, or mechanics that persistently interfere with meaning

Essays not written on the essay assignment will receive a score of 0.

Math

See attached chart for math skills on a grade-by-grade basis.

Social Studies & Science

Social Studies and Science are less formal.

Social Studies skills will be divided as follows:

<u>GRADE</u>	<u>COURSE</u>
K	Learning and working Now and Long Ago
1	A Child's Place in Time and Space
2	People Who Make a Difference
3	Continuity and Change
4	Your State's History
5	U.S. History and Geography: Making a New Nation
6	World History and Geography: Ancient Civilizations
7	World History and Geography: Medieval & Early Modern Times
8	U.S. History and Geography: Growth and Conflict
9	Historical and Social Sciences: Analysis Skills
10	World History, Culture, and Geography: The Modern World
11	U.S. History and Geography: Continuity & Change in the Twentieth Century.
12	Principles of American Democracy/Economics (18 weeks each)

Sciences will be a little different

GRADES K - 8

CORE IDEAS: Physical Science, Life, Earth, and Space

CROSSCUTTING CONCEPTS: Patterns; Energy and Matter; Structure & Function; Systems and System Models; Stability and Change; Proportion, quantity & scale; cause and effect

SCIENCE & ENGINEERING PRACTICES:

Ask questions and define problems; develop and use models; plan and carry out investigations, analyze & interpret data; use mathematics and computational thinking; construct explanations & design solutions; engage in argument from evidence; obtain and communicate information.

Grades 9 - 12: At their option, students must complete one-year courses in each of the following

- * Biology
- * Chemistry
- * Geology
- * Physics

Some Notes on Science

- * We want to engage students in multifaceted science and engineering practices in more complex, relevant and authentic ways.
- * We will provide an organizational framework to connect knowledge from various disciplines into a coherent and scientifically based view of the world.
- * Core ideas occur across grade levels and provide background knowledge for students to develop knowledge about phenomena in the natural world.

Appendix 2: Enrichment Courses (Proposed; Partial)

ACADEMIC

1. Academic Writing
2. Accounting
3. Advanced Critical Thinking
4. Agriculture
5. Anatomy and Physiology
6. Anthropology
7. Arabic
8. Astrophysics
9. Botany
10. Business Management
11. Cell Theory
12. Celtic Mythology

13. Chinese
14. Chinese Mythology
15. Computer Programming
16. Creative Writing
17. Data Management Systems
18. Dinosaurs
19. Drafting
20. Economics
21. Egyptian Mythology
22. ESOL (English as a second/other language)
23. Evolution
24. French
25. Functional Grammar
26. Genie Fiction
27. German
28. Great Men
29. Great Mysteries
30. Greek
31. Greek/Roman Mythology
32. Hebrew
33. History of the English Language
34. History Topics
35. Human Genetics
35. Interior Design
36. Investing
37. Italian
38. Japanese
39. Keyboarding
40. Korean
41. Landscaping
42. Literary Topics
43. Macroeconomics
44. Math Topics
45. Microbiology
46. Microeconomics
47. Moral Philosophy
48. Native American Mythology
49. Norse Mythology
50. Organic Chemistry
51. Paleontology
52. Philosophy
53. Plays (Drama)
54. Poetry
55. Political Philosophy

56. Religion Topics
57. Russian
58. Sociology
59. Spanish
60. Technical Writing
61. Using Graphic Calculators
62. Using Microsoft Office
63. Video Game Design
64. Zoology

RECREATIONAL

65. Baccarat (13)
66. Baseball
67. Basketball
68. Blackjack
69. Bowling
70. Bridge
71. Card Collecting (Sports, others)
72. Card Magic
73. Checkers
74. Chess
75. Coin Collecting
76. Coin Magic
77. Cooking
78. Craps (13)
79. Creating a Graphic Novel
80. Cross-Stich
81. Designing Board Games
82. Designing Weight Loss Programs
83. Developing an Exercise Program
84. Ethnic Cooking
85. Fantasy Sports
86. Film Editing
87. Football
88. Gambling on Sports (13)
89. Go
90. Golf
91. Handicapping Horse Races (13)
92. Health
93. Hearts
94. Ice-Hockey
95. Illusions: Large and Small
96. Knitting

97. Lacrosse
98. Magic (card game)
99. Nutrition
100. Photography
101. Photo Shop
102. Pinochle
103. Prop Magic
104. Pro Tools
105. Role Playing Games
106. Roulette (13)
107. Running
108. Sewing
109. Soccer
110. Solitaire
111. Spades
112. Stamp Collecting
113. Summer Olympics
114. Tennis
115. Texas Holdem and Poker Variations
116. Weightlifting
117. Winter Olympics
118. Woodworking
119. Writing Drama
120. Writing Fiction
121. Writing Literary Nonfiction
122. Writing Poetry

COGNITIVE/BEHAVIORAL

123. Addiction
124. Adolescent Psychology
125. Anger Management
126. Be Yourself
127. Behavior Management
128. Child Psychology
129. Behavior Management
130. Child Psychology
131. Conflict Resolution
132. Depression
133. Ethical Dilemmas
134. Goal Setting
135. Grief Management
136. How to Learn
137. How to Study

138. Hygiene
139. Job Skills
140. Making Friends
141. Money Management
142. Negotiation
143. Overcoming ADHD
144. Overcoming Bad Habits
145. Overcoming Dyslexia
146. Overcoming Embarrassment
147. Overcoming Procrastination
148. Peer Pressure
149. Positive Thinking
150. Psychology
151. Research Skills
152. Stress Management
153. Time Management
154. Writing Resumes

CULTURAL

155. Architecture
156. Art Appreciation
157. Art History
158. Ballet
159. CGI
160. Classical Music
161. Collage
162. Cultural Norms
163. Drawing
164. Etiquette
165. Film
166. Graphic Design
167. Modern Drama
168. Mosaic
169. Music Appreciation
170. Music Theory
171. Opera
172. Painting
173. The Peerage
174. Performance Arts
175. Playing Instruments
176. Popular Music
177. Reading Music
178. Sculpture

179. Social Situations
180. Television
181. Theatre
182. Tour of ... (City)
183. Tour of ... (Country)
184. Tour of ... (Museum)
185. Writing Music

NOTES/GUIDELINES ON ENRICHMENT

- * Most Courses will consist of multiple options and levels
- * Courses marked with (13) will be reserved for 13th grade members
- * Courses will typically last from 4 sessions (1 hour) to 16 sessions (4 hours)
- * After completing a course, you must choose a different course before going back to the original course.

Appendix 3: Summer Camps

1. Animal Care
2. Archaeology
3. Auto CAD
4. Baking
5. Be a Better Shopper
6. Building a Computer
7. Building a House
8. Building a Roller Coaster
9. Building a Sky Scrapper
10. Building a Track for Toy Cars
11. Car Maintenance
12. Creating a Website
13. Decorating Cakes, Cookies, etc.
14. Deep History
15. Defensive Driving/Driver's Ed
16. Digging Up Bones
17. Drawing
18. Drones
19. Effective Internet Research
20. Ethnic Cuisine
21. Everyday Science
22. Exploring Architecture
23. Exploring Art
24. Exploring Music
25. Fashion

26. First Aid
27. Graphic Design
28. History Detective
29. Interior Design
30. Jewelry Making
31. Know Your Rights
32. Landscaping
33. Landscaping Photography
34. Learn more about... (Religion)
35. Making Board Games
36. Making Card Games
37. Making Movies/Video
38. Making RPGs
39. Making Sushi
40. Making Video Games
41. Microsoft Excel
42. Microsoft PowerPoint
43. Microsoft Word
44. Painting
45. Pet Care
46. Photo Shop
47. Photography
48. Physics of ... (Sport)
49. Portrait Photography
50. Pro Tools
51. Remote-Controlled Cars/Vehicles
52. Robotics
53. Science Detective
54. Sculpture
55. Team Writing
56. Writing Fiction
57. Writing Play/Scripts
58. Writing Poetry
59. Writing Songs
60. Your Community...Your World.

* Summer Camps will last for 15 days each (no weekends)

* Enrollment is from May 1 to May 20

* Most Courses will have Beginner, Intermediate, and Advanced Levels

* Some Courses (ethnic cooking, Learning about... (Religion), etc.) will consist of multiple one-time courses

* Your Community... Your World is our Primary volunteer program. It can be taken once each summer. Successfully completing this course will allow

you to take your dream trip (You tell us where you want to go, and we will get you there).

Appendix 4: Proposed Game Modules for Rousix RPG

1. Abandoned Towns
2. American Indian Tribes
3. American West
4. Ancient China
5. Ancient Egypt
6. Ancient Greece
7. Anime
8. Aztec Empire
9. Babylon
10. Battle of Marathon
11. Beach
12. Berlin
13. Berlin 1940s
14. Cartoons
15. Circus
16. Colonial U.S.
17. Contemporary Fantasy
18. Deserted Island
19. Dystopian Society
20. Epic Fantasy
21. French Revolution
22. Gold Rush (California)
23. Gold Rush (Yukon/Alaska)
24. Holy Land
25. Horror Movies
26. Korean War
27. Locked Room Mysteries
28. Louvre
29. Machu Pichu
30. Mars
31. Mayans
32. Medieval Europe
33. Moon
34. Natural Science Museum
35. Noir
36. Ocean
37. Paleolithic Earth
38. Rainforest
39. Renaissance Europe

40. Roaring 20s
41. Roman Empire
42. Shakespeare's World
43. Spycraft
44. Texas Revolution
45. Titanic
46. Transylvania
47. Troy
48. Tsarist Russia
49. US Civil War
50. US Revolution
51. Vatican
52. Victorian England
53. Vietnamese War
54. Waterloo
55. WWI
56. WWII
57. Zombies
58. Zoo

Appendix 5: Curriculum

Rousix will use Common Core Standards for ELA and Math. See included sheets for specific goals.

Goal 1: Reading

Subgoals

A) Literature (K-12)

- Key Ideas & Details
- Craft & Structure
- Integration of Knowledge & Ideas
- Range of Reading & Level of Text Complexity

B) Informational Text (K-12)

- Key Ideas & Details
- Craft & Structure
- Integration of Knowledge & Ideas
- Range of Reading & Level of Text Complexity

C) Foundational Skills (K-5)

- Print Concepts (K-5)
- Phonological Awareness (K-2)
- Phonics and Word Recognition (K-5)
- Fluency (K-5)

Goal 2: Writing (K-12)

- A) Text Type and Purposes
- B) Production and Distribution of Writing
- C) Research to Build and Present Knowledge
- D) Range of Writing

Goal 3: Speaking and Listening (K-12)

- A) Comprehension and Collaboration
- B) Presentation of Knowledge and Ideas

Goal 4: Language (K-12)

- A) Conventions of Standard English
- B) Knowledge of Language
- C) Vocabulary Acquisition and Use

See attached chart for Math Goals on a grade-by-grade basis.

- Exponents
- Evaluating exponents with exponents and roots
- Solving Equations
 - * Working with unsolvable equations
 - * Solving for 1 variable in terms of another
 - * Solving equations involving radical expressions
- Absolute Value
- Direct Translation into Mathematical expressions
- Inequalities
- Systems of Linear Equations and Inequalities
- Solving quadratic equations by factoring
- Rational Equations and Inequalities
- Direct and Inverse Variation

3. Geometry and Measurement

- Geometric Notion
- Points and Lines
- Angles in the Plane
- Triangles
 - * Equilateral Triangles
 - * Isosceles Triangles
 - * Right Triangles and Pythagorean Theorem
 - * 30° 60° 90° Right Triangles
 - * 45° 45° 90° Right Triangles
 - * 3-4-5 Triangles
 - * Congruent Triangles
 - * Similar Triangles
 - * The Triangle Inequality
- Quadrilaterals
 - * Parallelograms
 - * Rectangles
 - * Squares
- Areas and Perimeters
 - * Perimeters of Squares and Rectangles
 - * Area of Squares and Triangles
 - * Area of Triangles
 - * Area of Parallelograms
- Other Polygons
 - * Angles in a Polygon
 - * Perimeter
 - * Area
- Circles
 - * Diameter/Radius
 - * Arc
 - * Tangent to a Circle
 - * Circumference
 - * Area
- Solid Geometry
 - * Solid Figures and Volume
 - * Surface Areas
- Geometric Perceptions
- Coordinate Geometry
 - * Slopes, parallel and perpendicular lines
 - * Midpoint Formula
 - * Distance Formula
- Transformations

4. Data Analysis
 - Data Interpretation

5. Statistics
 - Arithmetic Mean
 - Median
 - Mode
 - Weighted Average
 - Average of Algebraic Expressions
 - Using averages to find missing numbers

6. Probability
 - Elementary Probability
 - Geometric Probability

Appendix 6: Sample Rousix Calendar (2018-19)

August 1, 2018 - New Year begins
 August 1 - 31 - Enrollment
 September 1 - 2 - No activities
 September 3 - Labor Day (No Classes)
 September 4 - First Day of Classes
 Sept 4 - 9 - week 1
 Sept 10 - 16: week 2
 Sept 17 - 23: week 3
 Sept 24 - 30: week 4
 Oct. 1 - 7: week 5
 Oct. 8 - Columbus Day (No Classes)
 Oct 9 - 14 - week 6
 Oct 15 - 21 - week 7
 Oct 22 - 28 - week 8
 Oct 29 - Nov 4: week 9
 Nov 5 - 11: week 10
 Nov 12: Veteran's Day (observed, no classes)
 Nov 13 - 18: week 11
 Nov 19 - 25: Holiday Week 1 (Fall Break) week 12
 Nov 26 - Dec 2: week 13
 Dec 3 - 9: week 14
 Dec 10 - 16: week 15
 Dec 17 - 23: week 16
 Dec 24 - 30: Holiday Week 2 (Winter Break) - week 17
 Dec 31 - Jan 6 2019 - Holiday Week 3 (Winter Break) - week 18
 Jan 7 - 13: week 19

Jan 14 - 20: week 20
Jan 21 - 27: week 21 (MLK Day - Jan 21 - No classes)
Jan 28 - Feb 3: week 22
Feb 4 - 10: week 23
Feb 11 - 17: week 24
Feb 18 - 24: week 25 (President's Day - Feb 18 - No Classes)
Feb 25 - Mar 3: week 26
Mar. 4 - 10: week 27
Mar. 11 - 17: week 28 - Holiday Week (Spring Break)
Mar 18 - 24: week 29
Mar 25 - 31: week 30
Apr 1 - 7: week 31
Apr 8 - 14: week 32
Apr 15 - 21: week 33
Apr 22 - 28: week 34
Apr 29 - May 5: week 35
May 1 - 15: Enrollment for Summer Camps/SOS
May 6 - 12: week 36
May 20 - June 7: Summer Camp 1
May 28 - July 20: SOS
Jun 10 - 28: Summer Camp 2
July 1 - 19: Summer Camp 3
July 22 - 31: updates, no activities.

have multiple mediating factors such as changes in ecosystems over time or mechanisms that work in some systems but not in others.

Scale, proportion, and quantity: In considering phenomena, it is critical to recognize what is relevant at different measures of size, time, and energy and to recognize how changes in scale, proportion, or quantity affect a system's structure or performance.

There are two major scales from which we study science: directly observable and those processes which required tools or scientific measurement to be quantified and studied. To understand scale, students must understand both measurement and orders of magnitude. Understanding of scale, proportion, and quantity will progress as children get older. Young children engage in relative measures such as hotter/colder, bigger/smaller, or older/younger without referring to a specific unit of measure. As students age, it is important that they recognize the need for a common unit of measure to make a judgement of scale, proportion, and quantity. Elementary students start building this knowledge through length measurements and gradually progress to weight, time, temperature or other variables. Intersection with key mathematical concepts is vital to help students develop the ability to assign meaning to ratios and proportions when discussing scale, proportion, and quantity in science and engineering. By middle and high school, students apply this knowledge to algebraic thinking and are able to change variables, understand both linear and exponential growth, and engage in complex mathematical and statistical relationships.

Systems and system models: Because the world is too large and complex to comprehend all at once, students must define the system under study, specify its boundaries, and make explicit a model of that system provides tools for understanding and testing ideas that are applicable throughout science and engineering.

Models of systems can also be useful in conveying information about that system to others. Many engineering designs start with system models as a way to predict outcomes and test theories prior to final development ensuring that interactions between system parts and subsystems are understood. As students age, their ability to analyze and predict outcomes strengthens. In the early grades, students should be asked to express systems thinking through drawings, diagrams, or oral explanations noting relationships between parts. Additionally, even at a young age, students can be asked to develop plans for their actions or sets of instructions to help them develop the concept that others should be able to understand and use them. As student's age, they should incorporate more facets of the system including those facets which are not visible such as energy flow. By high school, students can identify the assumptions and approximations that went into making the system model and discuss how these assumptions and approximations limit the precision and reliability of predictions.

Energy and matter: Tracking fluxes of energy and matter into, out of, and within systems helps one understand the systems' possibilities and limitations.

The concept of conservation of energy within a closed system is complex and prone to misunderstanding. As a result, students in early elementary are only very generally exposed to the concept of energy. In the early grades, focus on the recognition of conservation of matter within a system and the flow of matter between systems builds the basis for understanding more complex energy concepts in later grades. In middle school and high school, students develop a deeper understanding of this concept through chemical reactions and atomic structure. In high school, nuclear processes are introduced along with conservation laws related specifically to nuclear processes.

Structure and function: The way in which an object or living thing is shaped and its substructure determines many of its properties and functions.

Knowledge of structure and function is essential to successful design. As such, it is important that students begin an investigation of structure and function at an early age. In early grades, this study takes the form of how shape and stability are related for different structures: braces make a bridge stronger, a deeper bowl holds more water. In upper elementary and middle school, students begin an investigation of structures that are not visible to the naked eye: how the structure of water and salt molecules relate to solubility, the shape of the continents and plate tectonics. In high school students apply their knowledge of the relationship of structure to function when investigating the structure of the heart and the specific function it performs.

Stability and change: For natural and built systems alike, conditions of stability and determinants of rates of change or evolution of a system are critical elements of study.

When systems are stable, small disturbances fade away, and the system returns to the stable condition. In maintaining a stable system, whether it is a natural system or a human design, feedback loops are an essential element. Young children experiment with stability and change as they build with blocks or chart growth. As they experiment with these concepts, the educator should assist them in building associated language and vocabulary as well as learning to question why some things change, and others stay the same. In middle school, understanding of stability and change extends beyond those phenomena which are easily visible to more subtle form of stability and change. By high school, students bring in their knowledge of historical events to explain stability and change over long periods of time, and they also recognize that multiple factors may feed into these concepts of stability and change.

Appendix 2: Science and Engineering Practices

The science and engineering practices describe how scientists investigate and build models and theories of the natural world or how engineers design and build systems. They reflect science and engineering as they are practiced and experienced. As students conduct

92

Arizona Science Standards

Investigations, they engage in multiple practices as they gather information to solve problems, answer their questions, reason about how the data provide evidence to support their understanding and then communicate their understanding of phenomena. Student investigations may be observational, experimental, use models or simulations, or use data from other sources. ~~These eight practices identified in Chapter 4 of A Framework for K-12 Science Education~~ are critical components of scientific literacy. They are ~~not~~ instructional strategies.

Distinguishing Science & Engineering Practices

	Science	Engineering
Developing and Using Models	Science often begins with a question about a phenomenon, such as "Why is the sky blue?" or "What causes cancer?" and seeks to develop theories that can provide explanatory answers to such questions. Scientists formulate empirically answerable questions about phenomena; they establish what is already known and determine what questions have yet to be satisfactorily answered.	Engineering begins with a problem, need, or desire that suggests a problem that needs to be solved. A problem such as reducing the nation's dependence on fossil fuels may produce multiple engineering problems like designing efficient transportation systems or improved solar cells. Engineers ask questions to define the problem, determine criteria for a successful solution, and identify constraints.
Plan and Carry Out Investigations	Science often involves constructing and using a variety of models and simulations to help develop explanations about natural phenomena. Models make it possible to go beyond what can be observed. Models enable predictions to be made to test hypothetical explanations.	Engineering uses models and simulations to analyze existing systems to see where flaws might occur or to test viable solutions to a new problem. Engineers use models of various sorts to test proposed systems and to recognize the strengths and limitations of their designs.
Use Mathematical and Computational Thinking	Scientific investigations may be conducted in the field or the laboratory. Scientists plan and carry out systematic investigations that require the identification of what is to be recorded and, if applicable, what are to be treated as the dependent and independent variables. Observations and data collected are used to test existing theories and explanations or to revise and develop new ones.	Engineers use investigations to gather data essential for specifying design criteria or parameters and to test their designs. Engineers must identify relevant variables, decide how they will be measured, and collect data for analysis. Their investigations help them to identify how effective, efficient, and durable their designs may be under a range of conditions.

(91)

92


<p>Analyze and Interpret Data</p>	<p>Scientific investigations produce data that must be analyzed to derive meaning. Because data usually do not speak for themselves, scientists use a range of tools, including tabulation, graphical interpretation, visualization, and statistical analysis, to identify significant features and patterns in the data, sources of error, and the calculated degree of certainty. Technology makes collecting large data sets easier providing many secondary sources for analysis.</p>	<p>Engineers analyze data collected during the tests of their designs and investigations; this allows them to compare different solutions and determine how well each one meets specific design criteria; that is, which design best solves the problem within the given constraints. Engineers require a range of tools to identify the major patterns and interpret the results.</p>
<p>Use Mathematics and Computational Thinking</p>	<p>In science, mathematics and computation are fundamental tools for representing physical variables and their relationships. They are used for a range of tasks: constructing simulations, statistically analyzing data, and recognizing, expressing, and applying quantitative relationships. Mathematical and computational approaches enable the behavior of physical systems to be predicted and tested. Statistical techniques are invaluable for assessing the significance of patterns or correlations.</p>	<p>In engineering, mathematical and computational representations of established relationships and principles are a fundamental part of design. For example, structural engineers create mathematically based analyses of designs to calculate whether they can stand up to the expected stresses of use and if they can be completed within acceptable budgets. Simulations of designs provide an effective test bed for the development.</p>
<p>Construct Explanations and Design Solutions</p>	<p>In science, theories are constructed to provide explanatory accounts of phenomena. A theory becomes accepted when it has been shown to be superior to other explanations in the breadth of phenomena it accounts for and in its explanatory coherence. Scientific explanations are explicit applications of theory to a specific situation or phenomenon, perhaps with a theory-based model for the system under study. The goal for students is to construct logically coherent explanations of phenomena that incorporate their current understanding of science, or a model that represents it, and are consistent with the available evidence.</p>	<p>Engineering design is a systematic process for solving engineering problems and is based on scientific knowledge and models of the material world. Each proposed solution results from a process of balancing competing criteria of desired functions, feasibility, cost, safety, aesthetics, and compliance with legal requirements. There is usually no single best solution but rather a range of solutions. The optimal solution often depends on the criteria used for making evaluations.</p>
<p>Engage in Argument from Evidence</p>	<p>In science, reasoning and argument are essential for identifying the strengths and weaknesses of a line of thinking and for finding the best explanation for a</p>	<p>In engineering, reasoning and argument are essential for finding the best possible solution to a problem. Engineers collaborate with their peers throughout the design</p>

Arizona Science Standards

	<p>phenomenon. Scientists must defend their explanations, formulate evidence, based on a solid foundation of data, examine their own understanding in light of the evidence and comments offered by others, and collaborate with peers in searching for the best explanation for the phenomenon being investigated.</p>	<p>process, with a critical stage being the selection of the most promising solution among a field of competing ideas. Engineers use systematic methods to compare alternatives, formulate evidence, based on test data, make arguments from evidence to defend their conclusions, evaluate critically the ideas of others, and revise their designs to achieve the best solution to the problem at hand.</p>
<p>Obtain, Evaluate, and Communicate Information</p>	<p>Science cannot advance if scientists are unable to communicate their findings clearly and persuasively or to learn about the findings of others. Scientists need to express their ideas, orally and in writing, using tables, diagrams, graphs, drawings, equations, or models and by engaging in discussions with peers. Scientists need to be able to derive meaning from texts (such as papers, the internet, symposia, and lectures) to evaluate the scientific validity of the information and to integrate that information with existing theories or explanations. Scientists routinely use technologies to extend the possibilities for collaboration and communication.</p>	<p>Engineers cannot produce new or improved technologies if the advantages of their designs are not communicated clearly and persuasively. Engineers need to express their ideas, orally and in writing, using tables, graphs, drawings, or models and by engaging in discussions with peers. Engineers need to be able to derive meaning from colleagues' texts, evaluate the information, and apply it usefully. Engineers routinely use technologies to extend the possibilities for collaboration and communication.</p>

Adapted from Box 3-2, National Research Council, pages 50-53

Appendix B: Core Ideas

The core ideas encompass the content that occurs at each grade and provides the background knowledge for students to develop sense-making around phenomena. The core ideas center around understanding the causes of phenomena in physical, earth and space, and life science; the principles, theories, and models that support that understanding; engineering and technological applications; and societal implications. The Arizona Science Standards integrate learning progressions from *A Framework for K-12 Science Education* to build a coherent progression of learning for these core ideas from elementary school through high school. The following fourteen big ideas for knowing science and using science are adapted from *Working with Big Ideas of Science Education* and represent student understanding of each core idea at the end of high school.

Core Ideas for Knowing Science	
<p>P1: All matter in the Universe is made of very small particles.</p>	<p>Atoms are the building blocks of all normal matter, living and nonliving. The behavior and arrangement of the atoms explains the properties of different materials. In chemical reactions atoms are rearranged to form new substances. Each atom has a nucleus, containing neutrons and protons, surrounded by electrons. The opposite electric charges of protons and electrons attract each other, keeping atoms together and accounting for the formation of some compounds.</p>
<p>P2: Objects can affect other objects at a distance.</p>	<p>All objects have an effect on other objects without being in contact with them. In some cases, the effect travels out from the source to the receiver in the form of radiation such as visible light. In other cases, action at a distance is explained in terms of the existence of a field of influence between objects, such as a magnetic, electric, or gravitational field. Gravity is a universal force of attraction between all objects, however large or small, keeping the planets in orbit around the Sun and causing terrestrial objects to fall towards the center of the Earth.</p>
<p>P3: Changing the movement of an object requires a net force to be acting on it.</p>	<p>A force acting on an object is not seen directly but is detected by its effect on the object's motion or shape. If an object is not moving, the forces acting on it are equal in size and opposite in direction, balancing each other. Since gravity affects all objects on Earth, there is always another force opposing gravity when an object is at rest. Unbalanced forces cause change in movement in the direction of the net force. When opposing forces acting on an object are not in the same line they cause the object to turn or twist. This effect is used in some simple machines.</p>
<p>P4: The total amount of energy in a closed system is always the same but can be transferred from one energy store to another during an event.</p>	<p>The total amount of energy in the Universe is always the same but can be transferred from one energy store to another during an event. Many processes or events involve changes and require an energy source to make them happen. Energy can be transferred from one body or group of bodies to another in various ways. In these processes, some energy becomes less easy to use. Energy cannot be created or destroyed.</p>

Arizona Science Standards

<p>E1: The composition of the Earth and its atmosphere and the natural and human processes occurring within them shape the Earth's surface and its climate.</p>	<p>Radiation from the Sun heats the Earth's surface and causes convection currents in the air and oceans creating climates. Below the surface, heat from the Earth's interior causes movement in the molten rock. This in turn leads to movement of the plates which form the Earth's crust, creating volcanoes and earthquakes. The solid surface is constantly changing through the formation and weathering of rock.</p>
<p>E2: The Earth and our solar system are a very small part of one of many galaxies within the Universe.</p>	<p>Our Sun and eight planets and other smaller objects orbiting it comprise the solar system. Day and night and the seasons are explained by the orientation and rotation of the Earth as it moves round the Sun. The solar system is part of a galaxy of stars, gas, and dust. It is one of many billions in the Universe, enormous distances apart. Many stars appear to have planets.</p>
<p>L1: Organisms are organized on a cellular basis and have a finite life span.</p>	<p>All organisms are constituted of one or more cells. Multicellular organisms have cells that are differentiated according to their function. All the basic functions of life are the result of what happens inside the cells which make up an organism. Growth is the result of multiple cell divisions.</p>
<p>L2: Organisms require a supply of energy and materials for which they often depend on, or compete with, other organisms.</p>	<p>Food provides materials and energy for organisms to carry out the basic functions of life and to grow. Green plants and some bacteria are able to use energy from the Sun to generate complex food molecules. Animals obtain energy by breaking down complex food molecules and are ultimately dependent on producers as their source of energy. In any ecosystem, there is competition among species for the energy resources and materials they need to live and reproduce.</p>
<p>L3: Genetic information is passed down from one generation of organisms to another.</p>	<p>Genetic information in a cell is held in the chemical DNA. Genes determine the development and structure of organisms. In asexual reproduction all the genes in the offspring come from one parent. In sexual reproduction half of the genes come from each parent.</p>
<p>L4: The unity and diversity of organisms, living and extinct, is the result of evolution.</p>	<p>All life today is directly descended from a universal common ancestor. Over countless generations changes resulting from natural diversity within a species are believed to lead to the selection of those individuals best suited to survive under certain conditions. Species not able to respond sufficiently to changes in their environment become extinct.</p>

99
99

Core Ideas for Using Science	
<p>U1: Scientists explain phenomena using evidence obtained from observations and or scientific investigations. Evidence may lead to developing models and or theories to make sense of phenomena. As new evidence is discovered, models and theories can be revised.</p>	<p>Science's purpose is to find the cause or causes of phenomena in the natural world. Science is a search to explain and understand phenomena in the natural world. There is no single scientific method for doing this; the diversity of natural phenomena requires a diversity of methods and instruments to generate and test scientific explanations. 2 (p. 30)</p> <p>Scientific explanations, theories, and models are those that best fit the evidence available at a particular time. A scientific theory or model representing relationships between variables of a natural phenomenon must fit the observations available at the time and lead to predictions that can be tested. Any theory or model is provisional and subject to revision in the light of new data even though it may have led to predictions in accord with data in the past. 2 (31)</p>
<p>U2: The knowledge produced by science is used in engineering and technologies to solve problems and/or create products.</p>	<p>The use of scientific ideas in engineering and technologies has made considerable changes in many aspects of human activity. Advances in technologies enable further scientific activity; in turn, this increases understanding of the natural world. In some areas of human activity technology is ahead of scientific ideas, but in others scientific ideas precede technology. 2 (p. 32)</p>
<p>U3: Applications of science often have both positive and negative ethical, social, economic, and/or political implications.</p>	<p>The use of scientific knowledge in technologies makes many innovations possible. Whether particular applications of science are desirable is a matter that cannot be addressed using scientific knowledge alone. Ethical and moral judgments may be needed, based on such considerations as personal beliefs, justice or equity, human safety, and impacts on people and the environment. 2 (p. 33)</p>

Appendix A: Equity & Diversity in Science

All students can and should learn complex science. However, achieving equity in science education is an ongoing challenge. Students from underrepresented communities often face "opportunity gaps" in their educational experience. Inclusive approaches to science instruction can reposition youth as meaningful participants in science learning and recognize their science-related assets and those of their communities⁴.

The science and engineering practices have the potential to be inclusive of students who have traditionally been marginalized in the science classroom and may not see science as being relevant to their lives or future. These practices support sense-making and language use as students engage in a classroom culture of discourse⁵. The science and engineering practices can support bridges between literacy and numeracy needs, which is particularly helpful for non-dominant groups when addressing multiple "opportunity gaps." By solving problems through engineering in local contexts (gardening, improving air quality, cleaning water pollution in the community), students gain knowledge of science content, view science as relevant to their lives and future, and engage in science in socially relevant and transformative ways⁷. Science teachers need to acquire effective strategies to include all students regardless of age, racial, ethnic, cultural, linguistic, socioeconomic, and gender backgrounds¹.

Effective teaching strategies² for attending to equity and diversity for

- **Economically disadvantaged students** include (1) connecting science education to students' sense of "place" as physical, historical, and sociocultural dimensions in their community; (2) applying students' "funds of knowledge" and cultural practices; and (3) using problem-based and project-based science learning centered on authentic questions and activities that matter to students.
- **Underrepresented racial and ethnic groups** include (1) culturally relevant pedagogy, (2) community involvement and social activism, (3) multiple representations and multimodal experiences, and (4) school support systems including role models and mentors of similar racial or ethnic backgrounds.
- **Indigenous students** include (1) learning and knowing that is land- and place-based, (2) centers (not erases or undermines) their ways of knowing, and (3) builds connections between Indigenous and western Science Technology Engineering and Mathematics (STEM), and (4) home culture connections⁸.
- **Students with disabilities** include (1) multiple means of representation, (2) multiple means of action and expression, (3) multiple means of engagement, (4) concrete experiences with realia, and (5) scaffolds in problem-based and project-based learning.
- **English language learners** include (1) literacy strategies for all students, (2) language support strategies with English language learners, (3) discourse strategies with English language learners, (4) home language support, (5) home culture connections, (6) concrete experiences with realia, and (7) scaffolds in problem-based and project-based learning.
- **Alternative education setting for dropout prevention** include (1) structured after-school opportunities, (2) family outreach, (3) life skills training, (4) safe learning environment, and (5) individualized academic support.
- **Girls' achievement, confidence, and affinity with science** include (1) instructional strategies, (2) curricular decisions, and (3) classroom and school structure.
- **Gifted and talented students** include (1) different levels of challenge (including differentiation of content), (2) opportunities for self-direction, and (3) strategic grouping.

101
102

Appendix 5: Interdisciplinary Connections

The crosscutting concepts along with the science and engineering practices provide opportunities for developing strong interdisciplinary connections across all content areas. Understanding core ideas in science can provide a context for helping students master key competencies from other content areas. It can also promote essential career readiness skills, including communication, creativity, collaboration, and critical thinking. This affords all students equitable access to learning and ensures all students are prepared for college, career, and citizenship.

English Language Arts

The science and engineering practices incorporate reasoning skills used in language arts to help students improve mastery and understanding in reading, writing, speaking, and listening. The intersections between science and ELA teach students to analyze data, model concepts, and strategically use tools through productive talk and shared activity. Evidence-based reasoning is the foundation of good scientific practice. Reading, writing, speaking, and listening in science requires an appreciation of the norms and conventions of the discipline of science, including understanding the nature of evidence used, an attention to precision and detail, and the capacity to make and assess intricate arguments, verbally and orally present findings, synthesize complex information, and follow detailed procedures and accounts of events and concepts. To support these disciplinary literacy skills, teachers must foster a classroom culture where students think and reason together, connecting around the core ideas, science and engineering practices, and the crosscutting concepts.

Mathematics

Science is a quantitative discipline, so it is important for educators to ensure that students' science learning coheres well with their understanding of mathematics.⁵ Mathematics is fundamental to aspects of modeling and evidence-based conclusions. It is essential for expressing relationships in quantitative data. The Standards for Mathematical Practice (MP) naturally link to the science and engineering practices and multiple crosscutting concepts within the Arizona Science Standards. By incorporating the Arizona Mathematics Standards and practices with critical thinking in science instruction, educators provide students with opportunities to develop literacy in mathematics instruction. The goal of using mathematical skills and practices in science is to foster a deeper conceptual understanding of science.

Health

Natural connections between Health and science exist throughout the Standards. The goals of Health being to maintain and improve students' health, prevent disease, and avoid or reduce health-related risk behaviors which can fit within the context of science standards.

Handwritten initials: JAM and JOL

Computer Science

Natural connections between science and computer science exist throughout the Standards, especially in the middle level and in high school. As students develop or refine complex models and simulations of natural and designed systems, they can use computer science to develop, test, and use mathematical or computational models to generate data. Students can apply computational thinking and coding to develop apps or streamline processes for collecting, analyzing, or interpreting data.

Technology

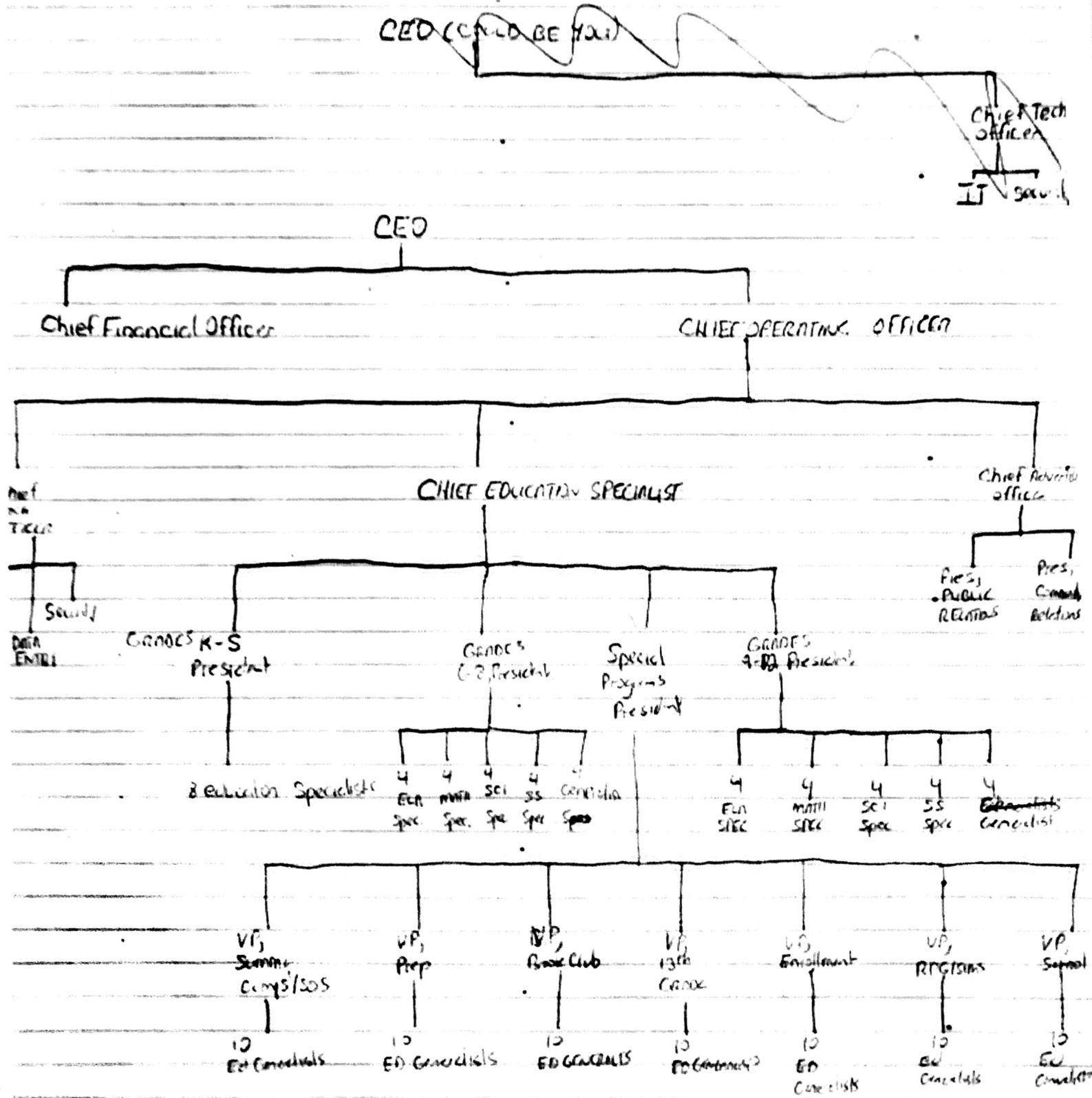
Technology is essential in teaching and learning science; it influences the science that is taught and enhances students' learning. Technologies in science run the range from tools for performing experiments or collecting data (thermometers, temperature probes, microscopes, centrifuges) to digital technologies for computing analysis or displaying data (calculators, computers). All of them are essential tools for teaching, learning, and doing science. Computers and other digital tools allow students to collect, record, organize, analyze, and communicate data as they engage in science learning. They can support student investigations in every area of science. When technology tools are available, students can focus on decision making, reflection, reasoning, and problem solving. Connections to engineering, technology, and applications of science are included at all grade levels and in all domains. These connections highlight the interdependence of science, engineering, and technology that drives the research, innovation, and development cycle where discoveries in science lead to new technologies developed using the engineering design process. Additionally, these connections call attention to the effects of scientific and technological advances on society and the environment.

Social Studies

Natural connections between the core ideas for using science and social studies exist throughout the Standards. Students need a foundation in social studies to understand how ethical, social, economic, and political issues of the past and present impact the development and communication of scientific theories, engineering and technological developments, and other applications of science and engineering. Students can use historical, geographic, and economic perspectives to understand that all cultures have ways of understanding phenomena in the natural world and have contributed and continue to contribute to the fields of science and engineering. Sustainability issues and citizen science provide contemporary contexts for integrating social studies with science. Citizen science is the public involvement in inquiry and discovery of new scientific knowledge. This engagement helps students build science knowledge and skills while improving social behavior, increasing student engagement, and strengthening community partnerships. Citizen science projects enlist K-12 students to collect or analyze data for real-world research studies, which helps students develop a deep knowledge of geography, economics, and civic issues of specific regions.

Appendix 8: Rousix Educational Division Hierarchical Flow Chart

Note: This chart does not reflect all employee needs. It is top-level + the education branch



Ed = Education
Spec = Specialist

130 Total Employees in education