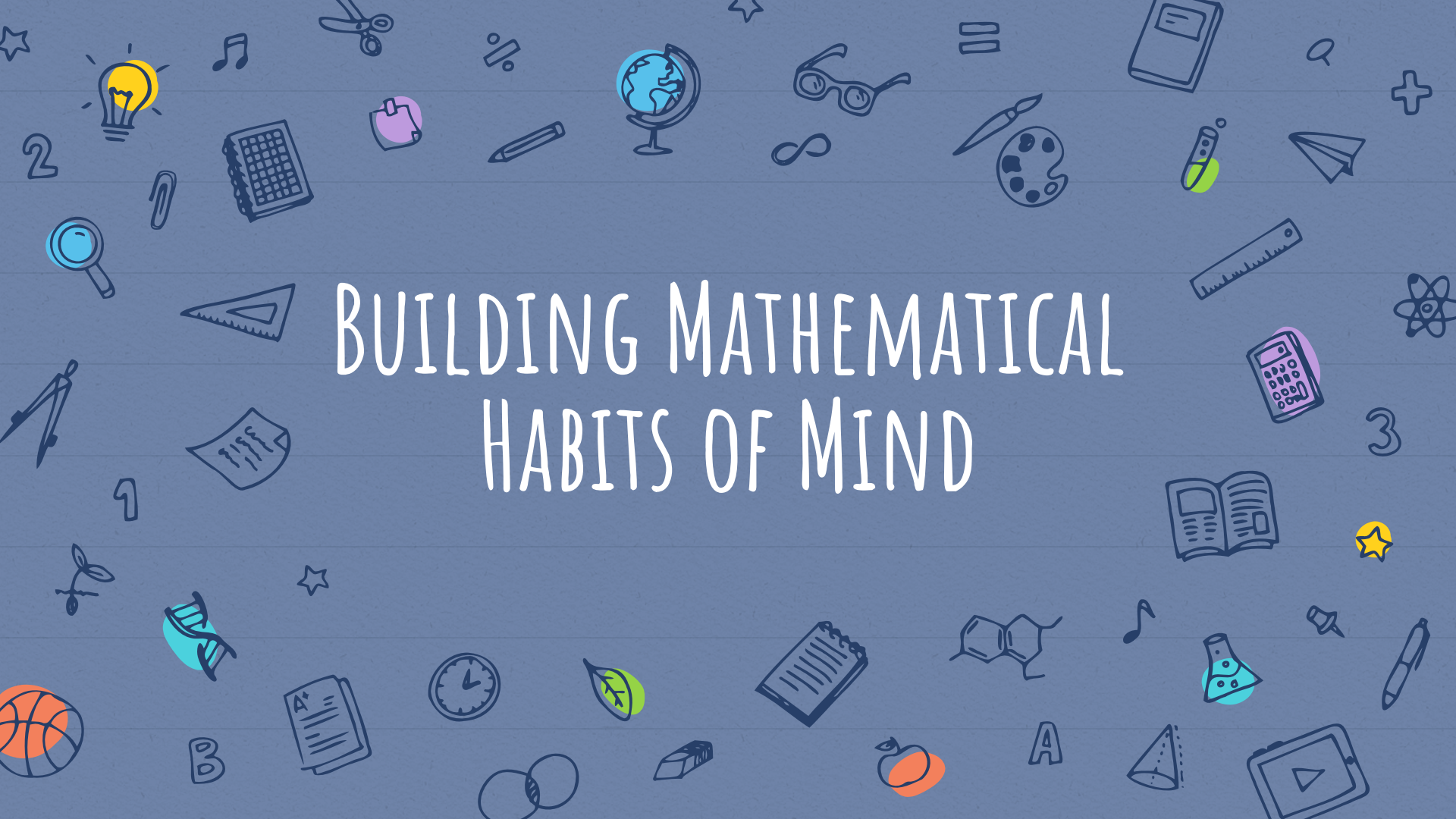


BUILDING MATHEMATICAL HABITS OF MIND



HEADLINES

WRITE A HEADLINE THAT CAPTURES THE MOST IMPORTANT ASPECT OF THE TED TALK



Note: Headlines is a thinking routine that helps students capture the heart of the topic being studied or discussed. It also can involve them in summing things up and coming to some tentative conclusions.



We All Can Do Math Because Our Brain Grows

Improves Brain About Thinking. Learning The Thinking Helped Me With Structure Grow Through Math

Learning Math Is About Learning To Think

Math is Not About Just Getting To X, It's About Getting to Y (why) and How

Learning Math Improves Your Brain (And Helps You THINK Better!)

Math Expands Our Ability To Think And Achieve In Different Domains - Let's Embrace It!

Determination Is More Important Than Natural Skill/Talent

Math Is A Tool

Learning Math Will Make You A Better Thinker

Math will Help Be Smarter. Math Is About Thinking

Math Makes You Think Logically

Growth Mindset - You Can Learn Math!

Math Makes You Smarter Through Systematic Thinking!

If You Have The Opportunity To Engage In Math - TAKE IT!

Math Makes You Think. Math Is Life

Math, Everything Needs To Be Coherent To The Next

Math Allows You To Reason

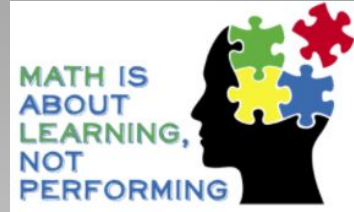
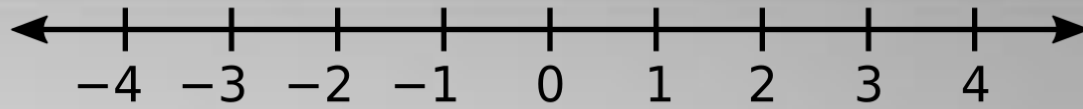
Don't Need A High IQ But Determination. It Improves Thinking Systematically

Math Makes Us Better At Thinking

"Math Makes You Smarter"



Questions & Discussions
Deepen Your
Mathematical
Understanding



MISTAKES ARE:
→ EXPECTED
→ RESPECTED
→ INSPECTED
→ CORRECTED

Everyone can learn math to the highest levels

Mistakes are valuable

Questions are really important

Math is about creativity and making sense

Math is about connections and communicating

Math class is about learning not performing

Depth is more important than speed

**KINDNESS
PATIENCE
POSITIVITY**



Mrs. Cardella

FIRST ATTEMPT IN LEARNING



GROWTH MINDSET

The power of **YET!**

I don't know...yet.

I'm not sure...yet.

I am not comfortable
with this...yet.

What Can I Say To Myself?

Instead of...

• I'm not good at this.

• I'm awesome at this.

• I give up.

• This is too hard.

• I can't make this any better.

• I just can't do math.

• I made a mistake.

• She's so smart. I will never be that smart.

• It's good enough.

• Plan A didn't work.

Try thinking...

• What am I missing?

• I'm on the right track!

• I'll use some of the strategies we've learned.

• This may take some time and effort.

• I can always improve, so I'll keep trying.

• I'm going to train my brain in Math.

• Mistakes help me to learn better.

• I'm going to figure out how she does it so I can try it!

• Is it really my best work?

• Good thing the alphabet has 25 more letters!

1. Make sense of problems and persevere in solving them
6. Attend to precision

2. Reason abstractly and quantitatively

3. Construct viable arguments and critique the reasoning of others

4. Model with mathematics

5. Use appropriate tools strategically

7. Look for and make use of structure.

8. Look for and express regularity in repeated reasoning.

8

Standards of Mathematical Practice Bucketed



Reasoning and explaining



Modeling and using tools



Seeing structure and generalizing



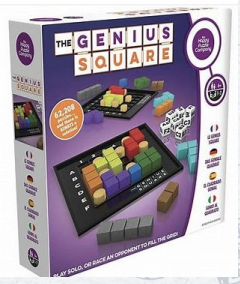
Overarching habits of mind of a productive mathematical thinker.





WHY PLAY GAMES?

- ✗ Opportunities for exploration in a risk free environment
- ✗ Encourages strategic mathematical thinking
- ✗ Multiple chances to practice and build computational fluency
- ✗ Supports a home school connection



GAME 24



Directions:

1. One card I selected and placed in the middle.
2. Using the each of the 4 numbers on the card, make 24.
3. You can use addition, subtraction, multiplication or division.
4. Each number may only be used once.

[Online GAME 24](#)

HOW TO PLAY GAME 24



Example: 1 Dot Single Digits

$$4 \times 3 = 12$$

$$2 \times 1 = 2$$

$$2 \times 12 = \mathbf{24}$$



Try this 2 Dot card



SET GAME



Directions:

1. The object of the game is to make a set of 3 cards
2. A set is comprised of 3 cards
3. Each of the features on the card (number, color, shape or shading) is either the same or different.

[Online SET GAME](#)

EXAMPLES OF A SET

For example, the following are SETs:



All three cards have the same shape, the same color, the same number of symbols and they all have different shading.



All three cards have different shapes, different colors, and different numbers of symbols and they all have the same shading.

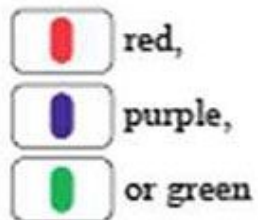


All three cards have different shapes, different colors, different numbers of symbols, and different shadings.

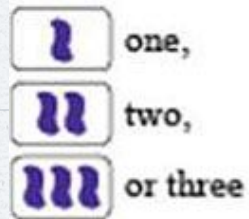
Shape



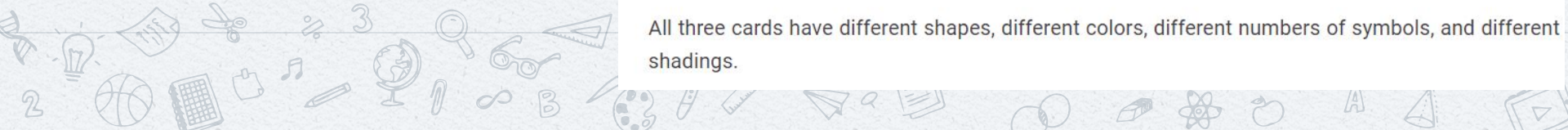
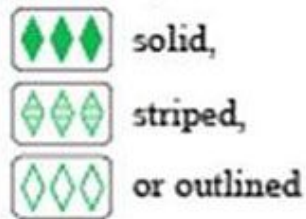
Color



Number



Shading



GENIUS SQUARE



Directions:

1. Roll the 7 dice together.
2. Each player places the blockers on the grid.
3. Each player will place the 9 shapes on the grid.
4. The player that places them first is the winner.



GENIUS SQUARE

Roll the Dice

Place the Blockers; Match the Dice's Letters and Number

RACE TIME!
Fit the Shapes on the Grid

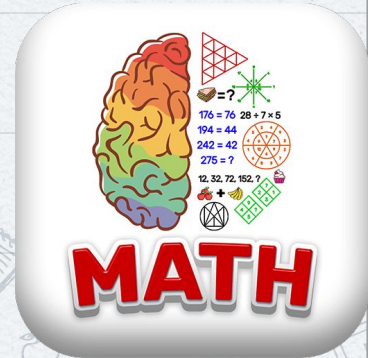
Hover to zoom

	1	2	3	4	5	6
A					●	●
B					●	
C		●		●		
D						●
E	●					
F						

	1	2	3	4	5	6
A						
B						
C						
D						
E						
F						

WHAT MATHEMATICAL HABITS OF MIND DOES EACH GAME SUPPORT?

Set Game	Game 24	Genius Square
<ul style="list-style-type: none"> ✗ Cognitive Development 	<ul style="list-style-type: none"> ✗ Multiple solutions 	<ul style="list-style-type: none"> ✗ Recognizing patterns
<ul style="list-style-type: none"> ✗ Visual Perception 	<ul style="list-style-type: none"> ✗ NCTM Standards: 	<ul style="list-style-type: none"> ✗ Spatial awareness
<ul style="list-style-type: none"> ✗ Physical Development 	<ul style="list-style-type: none"> Reasoning and Thinking, Problem Solving, Number 	<ul style="list-style-type: none"> ✗ Identify and solve complex problems
<ul style="list-style-type: none"> ✗ Social Development 	<ul style="list-style-type: none"> Relationships, 	<ul style="list-style-type: none"> ✗ Problem solving
<ul style="list-style-type: none"> ✗ Emotional Development 	<ul style="list-style-type: none"> Patterns, 	
	<ul style="list-style-type: none"> ✗ Encourages mathematical thinking 	



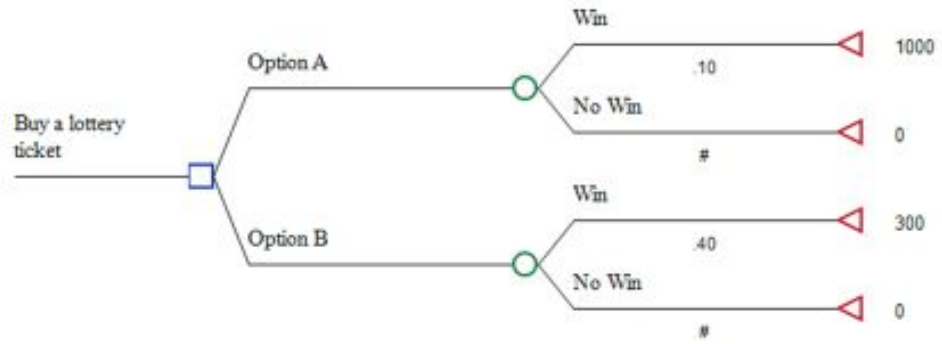
NOTICE AND WONDERING

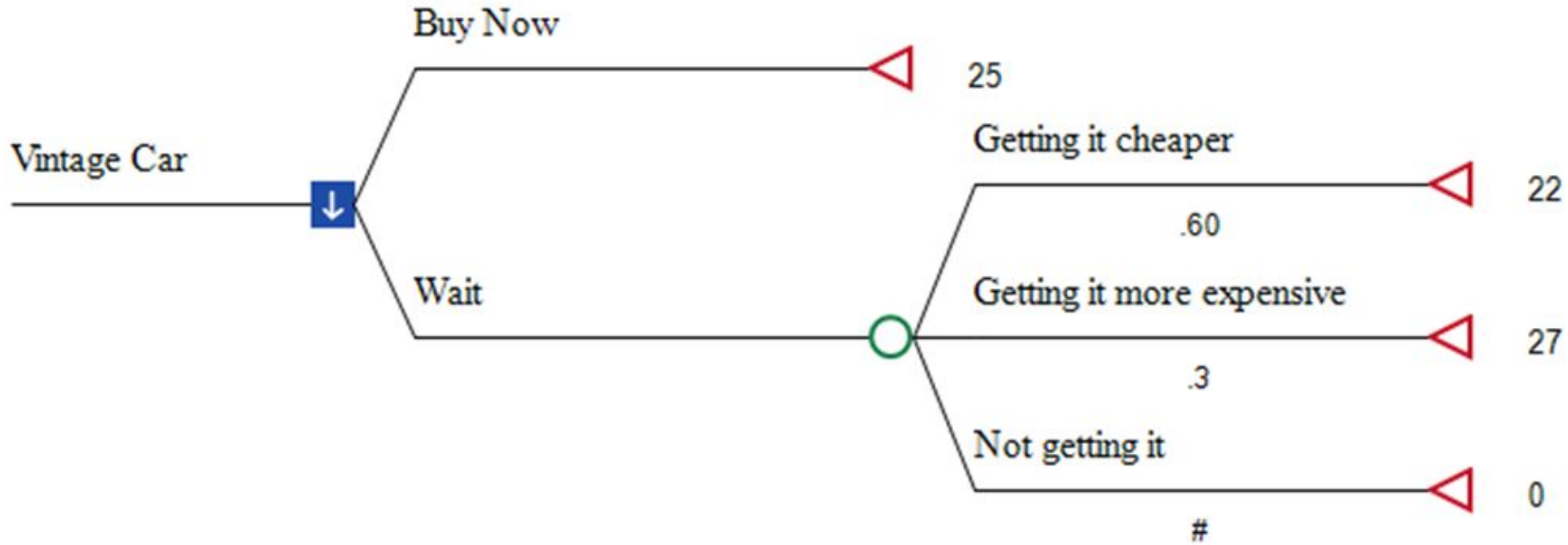
When playing, what did you notice or wonder?

What challenged you about the game?

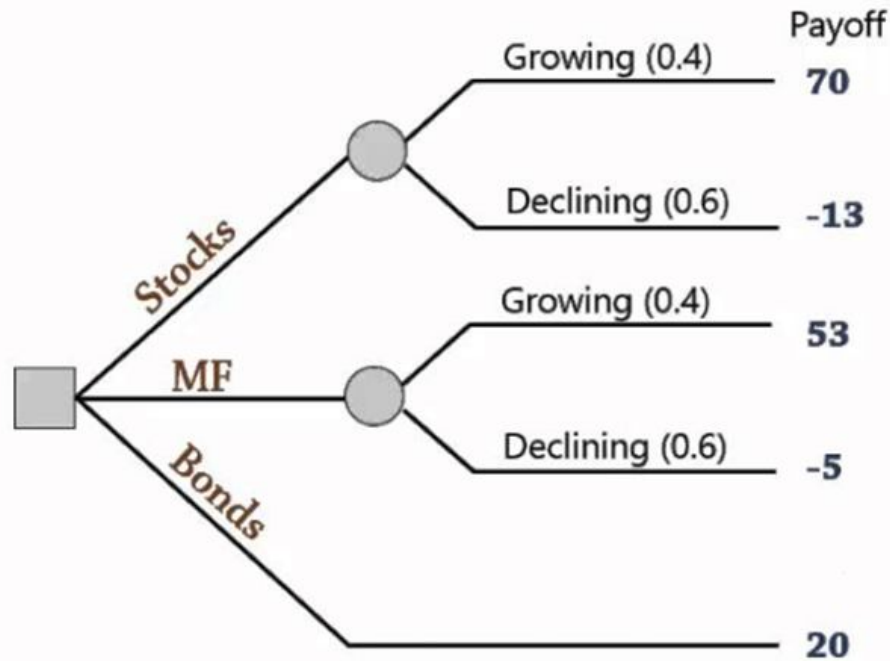
How do you think playing games like this can boost mathematical learning for your child?



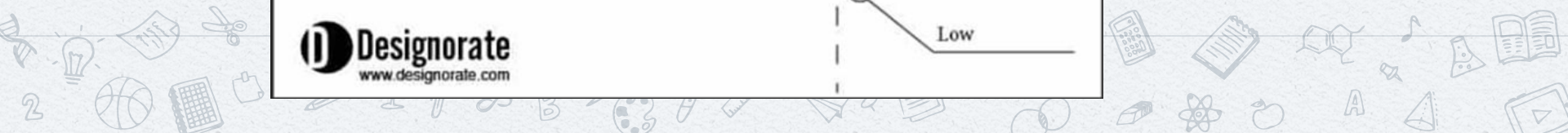
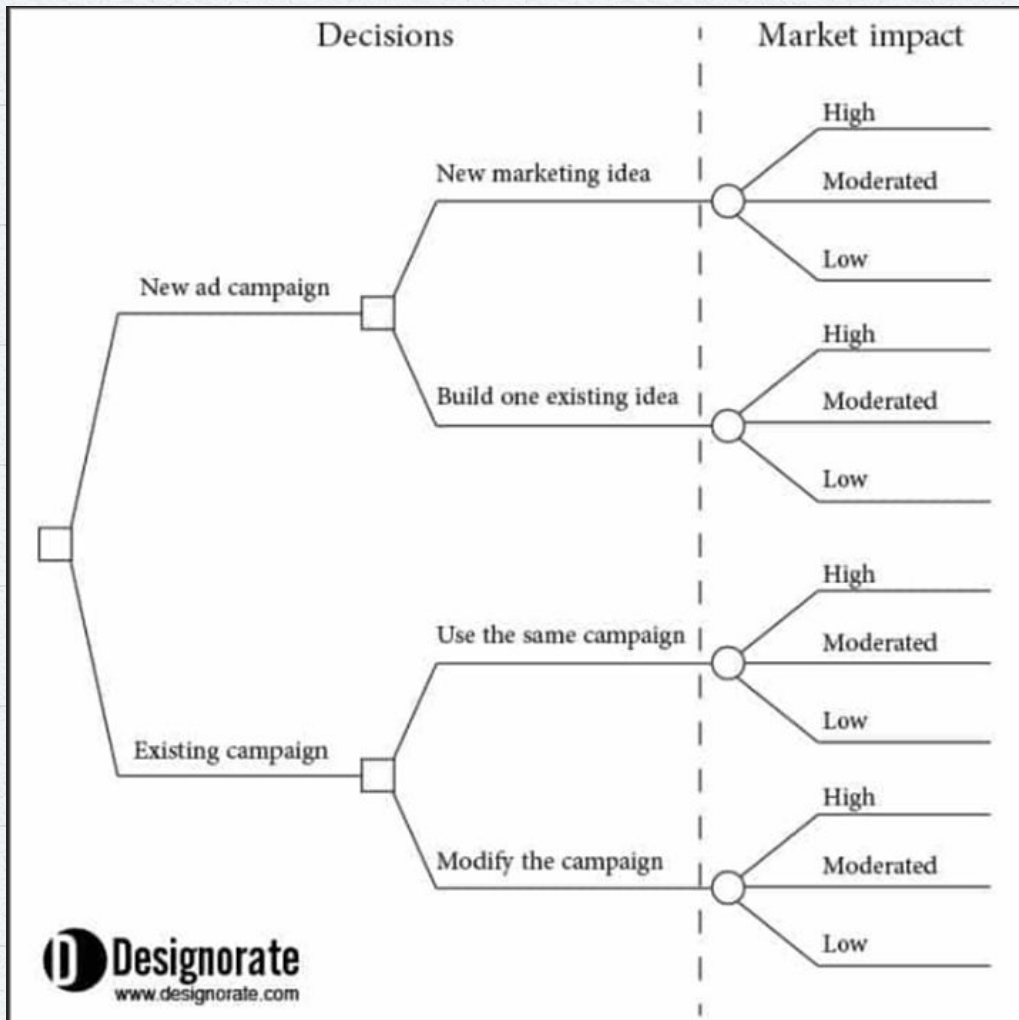


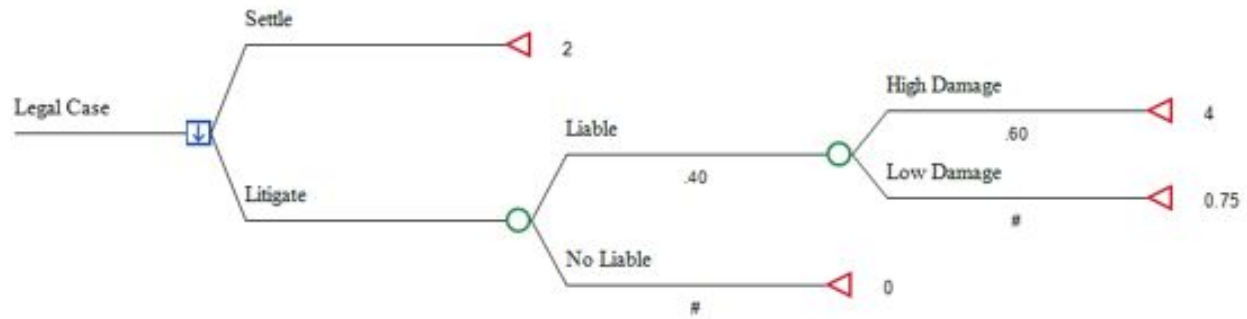


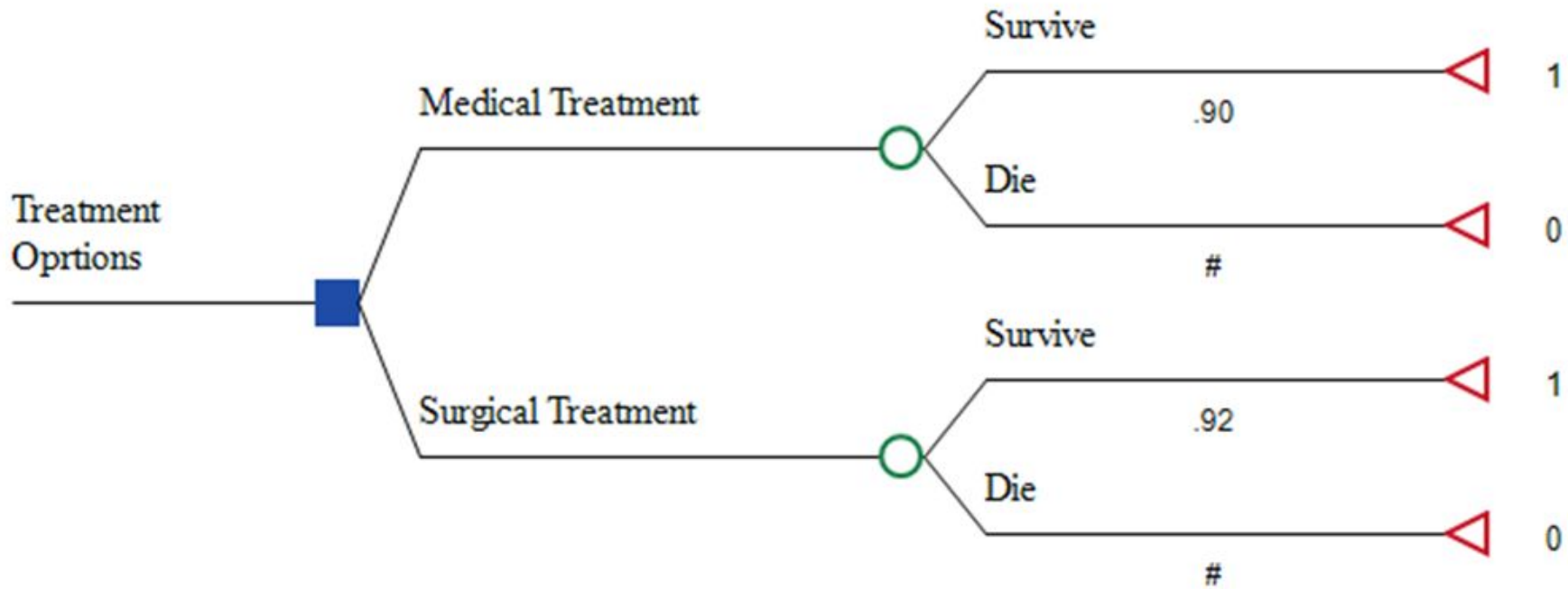
Decision Tree

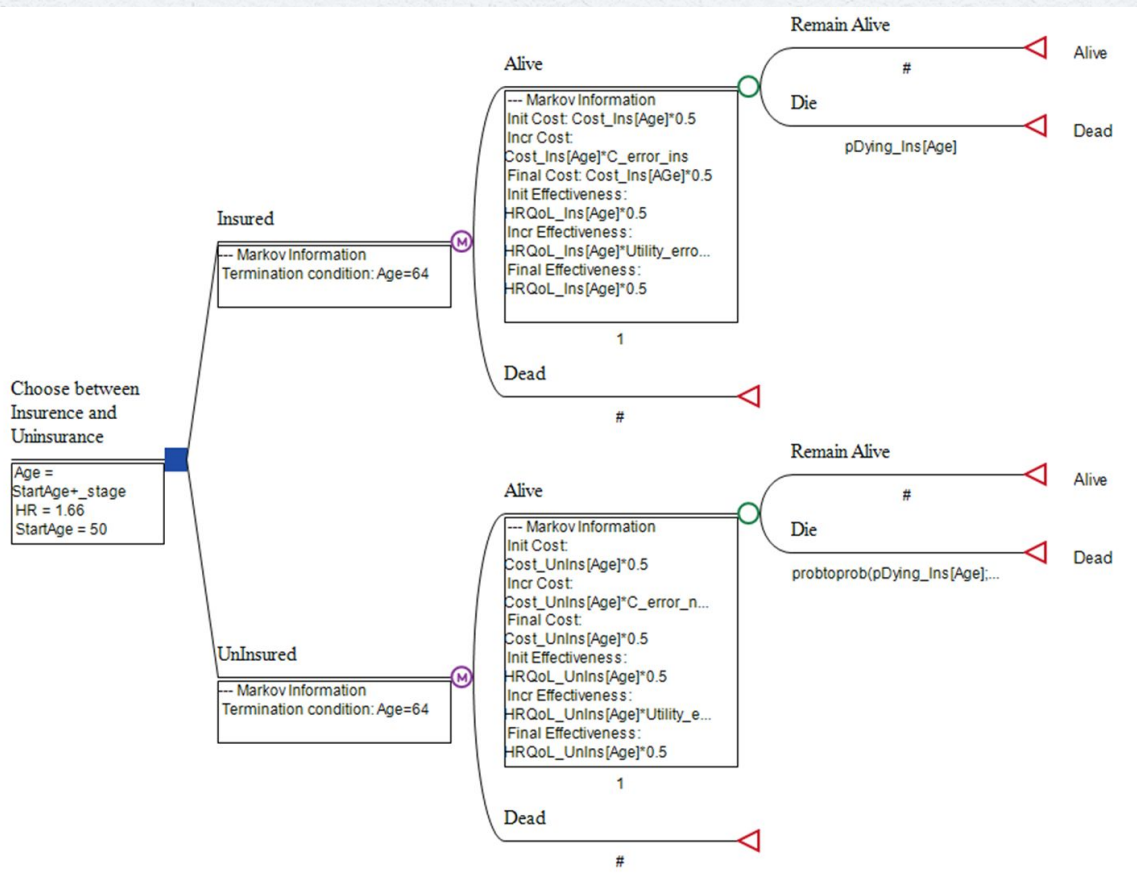


<i>Alternatives</i>	Growing	Declining
<i>Stocks</i>	70	-13
<i>Mutual Funds</i>	53	-5
<i>Bonds</i>	20	20
<i>Probability</i>	0.4	0.6









Feedback



I used to think...



Now I think...

think

I used to think.....my math skills were independent and unrelated to my overall thinking abilities.....But now I think.....that math makes us better at thinking



think

I used to think.....There were math people.....But now I think.....Math makes you smarter

think

I used to think.....Math was individualistic/competitive.....But now I think.....Math is collaborative/community building

think

I used to think.....It is a natural mind set and not everyone has it.....But now I think.....Determination is more important

think

I used to think.....Math is wonderful.....But now I think.....Math is wonderful and makes life better

GAMES



SETs Found:

Hover to Enlarge

Learn to Play

GET Puzzle Rates

Download our Interactive Flash tutorial!



SET GAME



What skills does a game like this develop?

- × Cognitive Development
- × Visual Perception
- × Physical Development
- × Social Development
- × Emotional Development



GAME 24



What skills does a game like this develop?

- ✗ Multiple solutions
- ✗ NCTM Standards: Reasoning and Thinking, Problem Solving, Number Relationships, Patterns, Connections
- ✗ Encourages mathematical thinking



Mathematical Habits of Mind

