YST1 – Task I: Applications of Instructional Planning & Presentation (part a)

Squishy Circuits, Electric PlayDoh

GENERAL INFORMATION

Lesson Title & Subject(s): Electric PlayDoh, completing a simple circuit.

Topic or Unit of Study: Physics

Grade/Level: 4th Grade

Instructional Setting:

Students are asked to sit at the front of the room facing the whiteboard for the video presentation. After presentation students will pair with their lab partners in groups of two, and choose an experiment table to receive instructions.

STANDARDS AND OBJECTIVES

Standards:

This lesson helps students prepare for these Next Generation Science Standards Performance

4-PS3-2. Make observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electric currents.

This lesson focuses on these aspects of NGSS Three Dimensional Learning:

Science & Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
Planning and Carrying Out Investigations. Make observations to produce data to serve as the basis for evidence for an explanation of a phenomenon or test a design solution.	PS3.A: Definitions of Energy. Energy can be moved from place to place by moving objects or through sound, light, or electric currents.	Energy and Matter. Energy can be transferred in various ways and between objects.
	PS3.B: Conservation of Energy and Energy Transfer. Energy can also be transferred from place to place by electric currents, which can then be used locally to produce motion, sound, heat, or light. The currents may have been produced to begin with by transforming the energy of motion into electrical energy.	

Lesson Objective(s):

Given an experimental model to follow, students will correctly complete a simple circuit with 100% accuracy as demonstrated by the post lab assessment.

MATERIALS AND RESOURCES

Instructional Materials:



For each group of students you will need:

- <u>Electric Play Dough Kit</u> available for purchase from our partner <u>Home Science Tools</u>. Includes:
 - o 4xAA battery holder
 - Piezoelectric buzzer
 - Jumbo LEDs (25 total 5 each in red, green, white, yellow, and blue)
 - White insulating dough (3.5 oz)
 - Red, blue, and green conductive dough (3.5 oz each)
- AA batteries (4, not included in the kit).
- Instructions available in both English and Spanish.
- Instructions for completing multiple circuits for students above grade level.

Resources:

- SciShowKids. (2016, Nov. 18) The Power of Circuits #sciencegoals.[Video] Youtube <u>https://www.youtube.com/watch?v=HOFp8bHTN30</u>.
- Finio, Ben, PhD (2002-2020) Science Buddies: Electric PlayDough. Retrieved from <u>https://www.sciencebuddies.org/teacher-resources/lesson-plans/squishycircuits#summary</u>

INSTRUCTIONAL PLAN

Sequence of Instructional Procedures/Activities/Events:

1. (A1c) Student Prerequisite Skills/Connections to Previous Learning: (5 minutes)

Based on our reading of simple circuits over the course of this school week, we have an experiment to showcase learning. Classroom Discussion: What examples of simple circuits do you remember? (ie Flashlights, calculator, etc)

(A1c) Presentation Procedures for New Information <u>and/or</u> Modeling: (5 minutes)

The class will watch a brief video that discusses simple circuits to help remind students of our reading and prepare students for our upcoming experiment.

Presentation Procedures for New Information:

Watch Video: The Power of Circuits #sciencegoals. (4:41 minutes) After video, students will find their lab partner and sit at their experiment desks.

3. (A1b.)Guided Practice:

Students will pair off into their known lab partners and experiment desks where materials and step by step instructions are waiting for them. Instructions are available to all students in both English and Spanish. Teacher will read through instructions with class, ask for any questions and release class to work independent of teacher instruction. **(A1a)** Teacher will pause class when she can see that they have completed steps 1-3, turning on the battery pack. Teacher will then ask students for feedback of why they believe the LED did not turn on. (5 Minutes) Students will return to step by step instructions continuing from step 4 to completion.

4. Independent Student Practice:

Students will complete steps 4 to completion on their own, documenting findings on the provided worksheets. (15 minutes). Once worksheets are completed, students will be given an assessment, open note, on their lab experiment via Google Classroom.(A1d) (10 minutes)

5. (A1d) Culminating or Closing Procedure/Activity/Event:

Students will self grade assessments as a group with the teacher. The assessment is available via google classroom. Students will discuss their findings, including how they think it would work if there were multiple lights that needed to light up, in preparation for our next lesson topic, multiple circuits.

Instructional Strategy (or Strategies):

Today's lab was taught using interactive instruction. Research shows that lessons coupled with activity or experiments can yield an increase in retention of subject material (Guest, 1999) Keeping the teacher interactive with students while they work though the steps of this experiment will ensure participation from all students.

Differentiated Instruction Accommodations:

For students identified as ELL a copy of all instructions and quiz is made available in Spanish. This is provided to each student regardless of ELL status. For students identified as gifted, the quiz contains an essay titled "What makes the LED light up?". They are asked to complete one paragraph discussing this topic. This essay is also included on all student quizzes but is marked as "stretch your thinking" for those at academic level.

Use of Technology:

At the start of class students will watch a video presenting the material we are about to cover on our interactive whiteboard. The assessment will be delivered via Google Classroom. Time permitting we will return to the front of the class to allow students to use the interactive whiteboard to draw an example of a simple circuit.

Student Assessment/Rubrics:

Students will show they have learned the objective by completing the assessment. The assessment will then be self-corrected as a group, with all questions being explained for any missed questions on the test. Students will also be provided an opportunity to discuss each question of the assessment to ensure understanding. Participation will yield the 100% passing score.