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Physical Properties [3rd grade]

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UNDERSTANDING BY DESIGN

Unit Cover Page

Unit Title: Physical Properties

Grade Level: 3 – special education

Subject/Topic Area(s): Science

Designed By: Leslie Davenport and Heather McOmber

Time Frame: 10 Days

School District: NEISD

School: Larkspur Elementary

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Brief Summary of Unit (Including curricular context and unit goals):

This is a unit focused on a TEK from the Curriculum Framework for the STAAR Alternate. Students will understand that everything is made up of matter and that matter can change from one state to another. Throughout the unit, students will learn about physical properties, the different states of matter, and about completing and writing experiment procedures. At the end of the unit students will complete an experiment where they have to change crayons into different states in order to create a multicolored crayon.

Unit: Physical Properties
Grade: 3rd Grade – Special Education

Stage 1: Desired Results

Established Goals (Standards)

TEKS (Curriculum Framework for STAAR Alternate)
(3.5/5.5) Matter and Energy. The student knows that matter has measurable physical properties and those properties determine how matter is classified, changed and used.

Understandings

Students will understand that…

- Everything is made up of matter
- The physical properties of an object can change depending on whether heat is added or removed

Essential Questions

How can properties be used to identify objects?
What are the observable physical properties of objects?
What causes physical properties to change?

Knowledge

Students will know…

- The three different states of matter: solid, liquid and gas
- Adding and removing heat will change the physical properties of an object

Skills

Students will be able to…

- Sort objects by physical properties
- Explain and show how to change states of matter
- Create a step-by-step procedure

Stage 2: Assessment Evidence

Performance Task:

- Students will create multi-colored crayons. They will have to write the step-by-step process for how to take single colored crayon pieces and turn them into a multi-colored crayon by adding and removing heat. The crayons will then be given to the kindergarten classes for them to use.

Other evidence:

- Pre/Post-assessment – students will answer questions about physical properties and states of matter
- Formative assessment – sorting states of matter

Stage 3: Learning Activities

(Steps taken to get students to answer Stage 1 questions and complete performance task)

- Day 1: Overview of physical properties
  - Pre-assessment – students will answer questions about physical properties and states of matter – see attached word document
  - Read aloud: Comparing Properties by Charlotte Guillain
  - Create a web of physical properties. Students can do this individually or this can be completed as a class. An attached sample is provided. The main idea of the web will be "physical properties." There will be four surrounding details: "color," "size," "texture," and "shape." Next to the color detail, have students use marker to color in different colors. Next to the size detail, have students tape different size straws (big, medium and small). Next to the texture detail, have students tape on examples of different textures (soft, hard, rough, smooth). Next to the shape detail, have students draw images of different shapes. Make sure to label all of the properties.
  - Homework option: Flipped video with vocabulary maps. Send students home with the vocab map worksheets. Have students watch the video at home to complete the maps. https://www.youtube.com/watch?v=j2gEZHEF4C0
  - Homework option: Flipped video with physical properties. Have students watch this video about examples of physical properties. http://www.youtube.com/watch?v=cGHgSIn6zUs
- Day 2: Physical properties application

- Physical properties – Students will look at two objects and compare their physical properties. Students will have to select which properties are the same and which are different. Materials needed: ping pong ball, beach ball, Dorito, CheeseIt, red crayon, blue crayon. See attached worksheet.
- Physical matter video: Matter and it's properties: What makes up Matter? http://player.discoveryeducation.com/index.cfm?guidAssetId=E4892186-BAC3-49C0-9534-C814404BF4A5&blnFromSearch=1&productcode=DSCE

- Day 3: States of matter intro
  - Discuss the 3 different types of matter. Read N2Y book (see attached): Solid, Liquid, and Gas Homework
  - BrainpopJr Video: http://www.brainpopjr.com/science/matter/solidsliquidsandgases/
  - Matter field trip: Walk around the school and find examples of the three different states of matter. Have students take a picture with the objects they find so they can remember them later. For higher level students, have them draw a picture of each of the objects and label them.
  - Formative assessment: Find images in a magazine of a solid, liquid and gas. Have students sort them into the correct category.
- Day 4: Changing matter by adding heat
  - Describe how objects can change states by adding heat
  - Read aloud: All About Heat by Lisa Trumbauer
  - Ice Lab: How long will it take to turn ice into water gas? Hypothesis: I believe it will take ___ minutes for the ice to turn into gas.
    - Experiment:
      - Put 1 cup of ice cubes in a beaker (*Take a picture)
      - Measure the amount of water every 5 minutes (*Take a picture)
      - Record measurement
      - When all ice is melted, place beaker on a hot plate and turn on high (*Take a picture)
      - Record measurement every 2 minutes until water has evaporated (*Take a picture in the middle and end)
      - Conclusion – Have students write: It took a total of ___ minutes for the ice to melt.
  - BrainpopJr Video: http://www.brainpopjr.com/science/matter/changingstatesofmatter/
- Day 5: Changing matter by removing heat
  - Describe how objects can change states by removing heat
  - Read aloud: Changing Shape by Donna Foley
  - Popsicle Lab: How do we change orange juice into a popsicle?
    - Experiment:
      - Pour orange juice into a dixie cup (*take a picture)
      - Put a popsicle stick into the cup (*take a picture)
      - Put cup into the freezer (*take a picture)
      - Let it freeze – have students check the freezer every 5 minutes
      - Pull cup out of freezer (*take a picture)
      - Pull popsicle out of cup and enjoy (*take a picture)
  - Changes in properties video: Changes in properites – What Makes Up Matter? http://player.discoveryeducation.com/index.cfm?guidAssetId=6994C0DC-BE6E-46BB-80A8-615B5B25D45C&blnFromSearch=1&productcode=DSCE
- Day 6: Applying changes in matters – how to write a procedure
  - Start by having students sequence the images from completed experiments. First sequence the ice lab as a class. Then have them do the popsicle lab individually. (You will need to have the pictures from labs printed). Have students explain what happened in each picture and write a statement for it as an example procedure.
  - Then you will create a procedure for a new experiment: Creating chocolate candies.
    - Students will say what they need to do, record on a large paper for students to see. (Have picture options available for students to sequence if they need assistance – picture choices are attached)
    - Procedure for students to create: Put chocolate chips into bowl. Melt chocolate in

microwave. Pour melted chocolate into mold. Put mold into fridge.

- Day 7: Follow procedure
    - Follow the procedure that was created yesterday to create the chocolate candies.
        - Experiment:
            - Put chocolate chips into bowl.
            - Melt chocolate in microwave.
            - Pour melted chocolate into mold.
            - Put mold into fridge.
- Day 8: Performance task: Writing the procedure
    - "The kindergarten classes are learning about rainbows. The teachers would like the students to be able to use multicolored crayons in their classrooms. I have offered to help them by making the crayons. The problem is that I only have single colored crayons. You will need to find a way to make these five single colored crayons into a multicolored crayon. Before you begin you need to write the procedure that you will follow in order to change the crayons into a multicolored crayon."
- Day 9: Performance task: Making the crayons
    - "The kindergarten classes are learning about rainbows. The teachers would like the students to be able to use multicolored crayons in their classrooms. I have offered to help them by making the crayons. The problem is that I only have single colored crayons. You will need to find a way to make these five single colored crayons into a multicolored crayon. Before you begin you need to write the procedure that you will follow in order to change the crayons into a multicolored crayon."
    - Teacher will provide potential materials that students will use: microwave, heating plate, Bunsen burner, heat lamp, crayons, bowls, mold, fridge, freezer
- Day 10: Review and post assessment
    - Give students post assessment
    - Review: Matter Millionaire

Performance Task Rubric:

Level 3: Student is able to apply knowledge. Requires student to make decisions "on his or her own" without the aid of choices.

Task	-	√	+
Write a procedure to create the multicolored crayon	Student includes 0-2 steps on how to create multicolored crayon.	Student includes 3-4 steps on how to create multicolored crayon	Student includes 5-6 steps on how to create multicolored crayon
Sentence structure	Student has one word steps	Student has incomplete sentences	Student has complete sentences
Making multicolored crayon	Student is unable to make a multicolored crayon	Students are able to follow some steps in creating a multicolored crayon	Student is able to create a multicolored crayon

Level 2: Student is able to recall basic facts Requires the student to make decisions or choices based on information that has just been recently presented or is right in front of the student.

Task	-	√	+
Write a procedure to create the multicolored crayon	Student incorrectly sequences when given visual choices	Student correctly sequences 3-4 steps when given visual choices	Student correctly sequences procedure when given visual choices
Sentence structure	Student is unable to describe steps	Student has 1-2 word sentence	Student has complete simple sentences
Making multicolored crayon	Student is unable to make a multicolored crayon	Students are able to follow some steps in creating a multicolored crayon	Student is able to create a multicolored crayon

Level 1: Student has beginning awareness. Requires students to show an awareness of a task and show that he or she knows that an activity is occurring or that a stimulus is being presented.

Task	-	√	+
Write a procedure to create the multicolored crayon	Student does not participate in sequencing	Student correctly sequences 3-4 steps when given visual choices with assistance	Student correctly sequences procedure when given visual choices with assistance
Sentence structure	Student is unable to copy or trace a sentence	Student copies or traces 1-2 words of a sentence	Student copies or traces a complete sentence
Making multicolored crayon	Student is unable to make a multicolored crayon with assistance	Students are able to follow some steps in creating a multicolored crayon with assistance	Student is able to create a multicolored crayon with assistance