Density Towers

Sections

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Rover Scouts

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Challenge Areas

COMMUNITY
CREATIVE
OUTDOOR
PERSONAL GROWTH

Scout Method Elements

COMMUNITY INVOLVEMENT
LEARNING BY DOING
NATURE AND THE OUTDOORS
PROMISE AND LAW
PERSONAL PROGRESSION
PATROL SYSTEM
SYMBOLIC FRAMEWORK
YOUTH LEADING, ADULTS SUPPORTING

SPICES Growth Areas

CHARACTER
EMOTIONAL
INTELLECTUAL
PHYSICAL
SOCIAL
SPIRITUAL

The Adventure

Explore the concept of density and how liquids and objects with different densities interact.

Plan

1. Begin to investigate the concept of density. Think about why some things float, while other things sink, and why you think this might be.
2. Collect the materials required for the experiments and recording your results. Communicate with your patrol and leaders if you need to bring items from home.
3. Develop hypotheses regarding which liquids will float above others and why.
4. Read the safety requirements and discuss with your leaders/adult supervisors what supervision and safety requirements might be needed.
5. Collect the equipment and ingredients that you will need to make your density towers. You will need the following: water, oil, a small jar that is ideally relatively tall and skinny, honey, golden syrup or corn syrup, dish washing liquid, water with food colouring in it, vegetable oil, a highlighter, UV-active paint, tonic water containing quinine, baby oil, glitter, a dark room, and a UV-torch.

Do

1. Set up the experiment and record materials and hypotheses.
2. Make sure everyone is aware of the safety rules.
3. Start by pouring some water into your glass or clear jar, then carefully add the same amount of oil on top. Try adding objects to the jar, see if you can get an object to float at each level.
4. Shake your density jar and see what happens. What happens if you leave the jar to sit after shaking?
5. To make a larger density jar, carefully add equal parts of honey, golden or corn syrup, dish soap, water and food colouring, and vegetable oil in this order.
6. See if you can get objects to float in your new density jar at each level.
7. Make sure you record your observations during the experiment.
8. Now let’s try to make a glowing density jar. First make glow water by breaking open a highlighter and soaking the ink cartridge in water for several hours.
9. Into a glass or clear jar add a layer of UV-active paint, tonic water (must contain quinine), glow water, baby oil and glitter, in this order.
10. After letting it settle for a few minutes, view your glowing density tower and place it under a blacklight in a dark room. Try adding drops of glitter and neon paint to the top to watch the effects of density in action.

Review

1. Evaluate your hypotheses. Which liquids floated above other liquids? Why? Science Spark provides a good explanation of density.
2. Think about other household liquids, where do you think they would float? Try adding them to your density jar to test.
3. Can you think of any examples of density having an effect on your day to day life?
4. If you were to do this activity again, what would you do the same? What would you do differently?

Safety

- Sharps warning: If you make your density tower using a glass, you should consider the risk of broken glass. Broken glass may cause cuts and should be handled appropriately with care.

Variations

- Investigate where other household liquids sit on in the density tower? Do they mix or float?
- Try building a density tower using only water. What can you do to change the density of water in order to build the tower? Fill separate glasses with water, then covering one with a card, tip is upside down and over the other glass before gently sliding out the card.
- A larger program can be build using other ‘Chemical Properties’ or chemistry challenge cards.
- Consider using as a demonstration only for younger sections.