

Materials for Each Student (4 Science Lessons)

Let's Go Camping! Build Your Family Tent!

1. Family Sheet
2. Straws
3. Rubber bands
4. Wax paper sheet
5. Foil sheet
6. Plate
7. Masking tape
8. Spray bottle filled with water
9. Worksheet

Ready, Get Set, Go! Build a Catapult:

1. Popsicle Sticks
2. Rubber bands
3. String
4. Scissors
5. Spoon
6. Bouncy ball
7. Worksheet

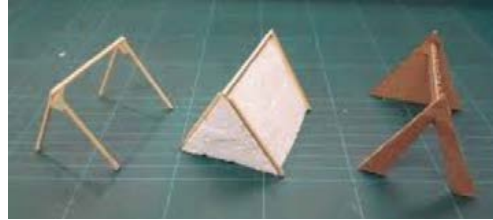
Lava Lamp Fun

1. Mason jar
2. Vegetable oil
3. Water
4. Food coloring
5. Alka-seltzer tablets
6. Worksheet

Build a Marble Maze

1. Straws
2. Marble
3. Glue
4. Scissors
5. Masking tape
6. White and colored sheets of paper
7. Worksheet

Lesson 1: Let's Go Camping! Build Your Family a Tent! (STEM)



Story: It's summer vacation and a family decided to go camping in Yosemite. They pack up and drive up for 5 hours. Then they get the unfortunate news of heavy rainstorm. Challenge: You're going to use your **civil engineering** skills to design and build shelter for this family. Build a tent to keep this family safe and dry! Your tent will have to withstand the heavy rainstorm and keep its **stability**!

Vocabulary:

1. Civil engineering - Field of engineering concerned with the design and construction of dams, bridges, and towers.
2. Stability - in balance

Materials:

Family Sheet
Straws
Rubber bands
Wax paper sheet
Foil sheet
Plate
Masking tape
Spray bottle filled with water
Worksheet

Procedure:

1. Tell the students the story of the family going camping and explain the problem.
2. Give the students the Challenge - to build a tent that will protect them from the rain.
3. Explain the 2 vocabulary words - civil engineering and stability.
4. Explain what materials will be available for them to use.
5. Show the video for building the foundation for the tent.
6. Give students the worksheet to draw the design of their tents.
7. Give out materials to build the tents. (They may build for 20 minutes)
8. Spray water onto the tents to see if the family inside stays dry.
9. Students will fill out the reflection part of the worksheet.

Lesson 2: Ready, Get Set, Go! Build a Catapult (STEM)



Video: https://www.youtube.com/watch?v=WpLFC_SOpXs

Vocabulary:

- Potential Energy - Energy stored in an object due to its position is called potential energy.
- Kinetic Energy - Moving energy
- Gravity - the force by which a planet or other body draws objects toward its center (The force of gravity keeps all of the planets in orbit around the sun)
- Force - when you add more force, the ball will travel faster and bounce farther

Materials:

- Popsicle Sticks
- Rubber bands
- String
- Scissors
- Bottle cap
- Bouncy ball
- Worksheet

Procedure:

1. Explain the lesson for the day and go over the vocabulary words with the students.
2. Show the video of how to make the catapult.
3. Have students fill out their design for the catapult on the worksheet.
4. Students will get the materials and build their catapults.(15 min.)
5. They will test out their catapults for 3 trials and record the results on the worksheet.
6. Students will fill out the Reflection portion of the worksheet.

Lesson 3: Lava Lamp Fun (Chemistry)



Video: <https://www.pbs.org/parents/crafts-and-experiments/diy-lava-lamp>

Materials:

- Mason jar
- Vegetable oil
- Water
- Food coloring
- Alka-seltzer tablets
- Worksheet

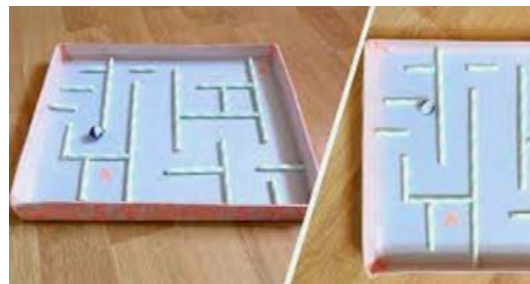
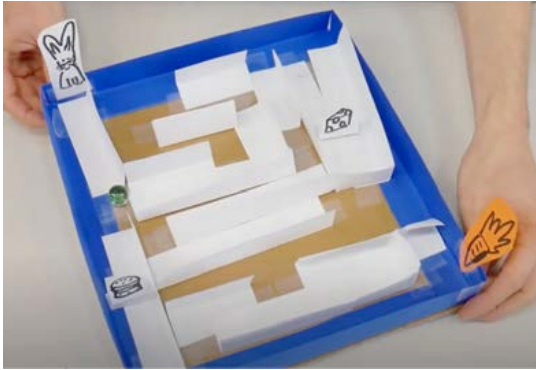
Vocabulary:

- Irreversible chemical change - the reactants convert to products, but products can't go back to reactants.
- Reversible chemical change - the material that was altered returns to its original state

Procedure:

1. Introduce the vocabulary word and discuss examples of irreversible chemical change vs. reversible chemical change.
2. Give examples of chemical changes and ask if its irreversible or reversible change.
 - boiling an egg (Irreversible)
 - freezing water (Reversible)
 - making salad dressing with oil and vinegar (Reversible)
 - roasting marshmallow (Irreversible)
3. Show video on how to make a lava lamp. Discuss if the lava lamp is an example of irreversible or reversible chemical change.
4. Give out materials. (except the alka seltzer)
5. After everyone is ready, pass out $\frac{1}{4}$ of the tablet to put into the jar. Observe what happens.
6. Have kids fill out the worksheet.

Lesson 4: Build a Marble Maze (STEM)



Video: <https://www.youtube.com/watch?v=IIJyelhIV4Q>

Vocabulary:

Motion - the process of an object moving or being moved.

Force - an action that changes or maintains the motion of a body or object.

Materials:

- Straws
- Marble
- Glue
- Scissors
- Masking tape
- White and colored sheets of paper
- Worksheet

Procedure:

1. Tell the students that they will come up with a story of a character and something that character wants and 2 things that the character does not want. For example, a rabbit that wants a carrot but doesn't want a hamburger or a piece of cheese.

2. Explain the vocabulary words motion and force.
3. Show video of how to make the maze for the character to reach the goal. (example: rabbit getting the carrot.)
4. Give out the materials to build the maze. Have students build the wall, make the character, goal, and 2 things the character doesn't like. Have kids build the Marble Maze for 20 minutes.
5. Students should test out the Marble Maze and reflect on what is working well or what they need to fix. They can make it easy or more challenging.
6. Have students fill out the reflection part of the worksheet.

