



Bible Story

Shadrach, Meshach, and Abednego Stand

True
Daniel 3

Castle Callout

Armor Up with Truth!

Materials

- tall clear vase or jar
- clear bowl
- pillar candle that is no taller than the bowl
- vinegar
- baking soda
- matches
- cloth or paper towel

Safety Tip

Tie up long hair and loose clothing before lighting matches. Have a cloth on hand to wipe up spills to avoid slip/fall hazards.

As this experiment requires the use of a flame, we recommend this experiment as demonstration only with younger Knights and under close supervision with older Knights.

Experiment 1

Invisible Fire Extinguisher

I. Preparation

Gather materials.

Test the experiment beforehand to determine the right amount of baking soda and vinegar for your large vase or jar. You want the bubbles to rise to about $\frac{3}{4}$ of the height of the jar. Start with 1 tablespoon of baking soda and $\frac{1}{2}$ cup of vinegar and adjust amounts as needed.

II. Introduction

Say Something Like: **In today's story, God sent help to Shadrach, Meshach, and Abednego in the fiery furnace and protected them from the heat of the fire. We are not going into a fire; we are going to put out a fire in a way that is different from what you may have seen before.**

Ask: **What are some ways that people put out fires?**

Ask: *(show materials)* **Do you see anything here that would help put out a fire?**

III. Experiment

Step 1. Place the pillar candle in the bowl and light it.

Step 2. Mix approximately 1 tablespoon of baking soda and $\frac{1}{2}$ cup of vinegar in the large vase or jar. Watch until the bubbling reaches its peak and begins to subside.

Step 3. Tilt the jar over the lit candle as if you were going to pour the mixture onto the candle, but do NOT actually let the liquid come out of the jar. You are allowing the gas that has collected above the liquid to fall onto the candle. What happens?

Step 1



Step 2



Step 3





IV. Side Quest:

Knights can perform a similar experiment themselves. Divide your group into teams, if needed. Give each team a birthday candle, a lump of clay, a punch cup, baking soda, and vinegar. They will use clay to place a birthday candle inside a punch cup and sprinkle two large pinches of baking soda around the candle. An adult should light the birthday candle, and then Knights can pour about 3 tablespoons of vinegar into the bottom of the cup. The same reaction will take place, with the carbon dioxide filling the cup until the candle goes out.

V. How does it work?

When vinegar and baking soda mix, they have a chemical reaction. As part of the reaction, a gas called carbon dioxide is formed. Carbon dioxide is more dense than oxygen, so when you pour the carbon dioxide over the candle, it sinks into the bowl and pushes out the oxygen. Fire needs oxygen to burn, so the candle goes out. This is the same principle at work in carbon dioxide fire extinguishers.

VI. Bible Tie-in

Fire can be scary! In today's story, God protected the three friends from the fire. God is also at work with people today, giving us the knowledge to protect ourselves with inventions like fire extinguishers, fireproof fabrics, sprinkler systems, and smoke alarms. It's important to be safe and protected, but it is good to know that just like for Shadrach, Meshach, and Abednego, our God is with us and watching over us.



Bible Story

Shadrach, Meshach, and Abednego Stand True

Daniel 3

Castle Callout

Armor Up with Truth!

Materials

-  glass or ceramic plate
-  clear glass jar or vase with a smooth rim
-  penny
-  candle that is shorter than the jar or vase
-  lump of modeling clay
-  pitcher of water
-  matches
-  cloth or paper towel

Safety Tip

Tie up long hair and loose clothing before lighting matches. Have a cloth on hand to wipe up spills to avoid slip/fall hazards.

As this experiment requires the use of a glass or ceramic plate, a glass jar or vase, and flame, we recommend this experiment as demonstration only with younger Knights and under close supervision with older Knights.

Experiment 2

Water Suction

I. Preparation

Gather materials.

II. Introduction

Say Something Like: **In today's story, God sent help to Shadrach, Meshach, and Abednego in the fiery furnace and protected them. We are going to see if fire can help us with a challenge.**

Ask: *(Show Knights materials)* **Have you seen materials like these before? How do we normally use them?**

Ask: *(Place the penny on the plate with the candle in place and pour enough water into the plate to just cover the penny.)* **I'd like to get this penny out without getting my fingers wet. What are some things I might try to do that?**

III. Experiment

Step 1: Place the candle in the center of the plate. Use the modeling clay to stabilize it, if necessary.

Step 2: Pour enough water onto the plate to just cover the penny.

Step 3: Light the candle. Turn the vase or jar upside down over the burning candle. What happens?

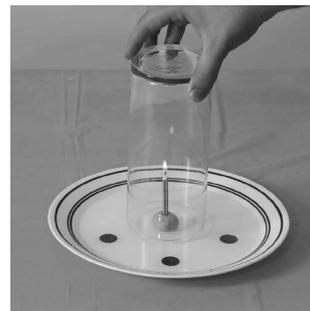
Step 4: Ask a Knight to pick up the dry penny.

Step 5: Invite older Knights to perform the experiment themselves (divide your group into teams with adult supervision, if needed). Repeat steps as time allows or until each Knight who wants a turn gets one.

Steps 1



Step 2



Step 3





IV. How does it work?

The heat from the burning candle causes the air molecules inside the vase to start moving faster. As they move faster, they need more room. Some of the molecules escape under the rim of the vase. When the fire goes out, the air molecules cool and slow down. However, since some molecules escaped the vase, there are fewer molecules. The air pressure inside the vase is lower than it is outside the vase. In response, the air outside the vase presses in, pushing the water along with it.

Note: Some online sources will say that burning up the oxygen causes the decrease in pressure inside the vase. This is an inaccurate explanation. The process of burning destroys oxygen but creates carbon dioxide and carbon monoxide to take its place.

V. Bible Tie-in

Fire can be scary. In today's story, God used a fiery furnace to show God's power to King Nebuchadnezzar. Using fire to pull the water off a penny is not a miracle, but you can let it remind you that God is the one who is powerful in our lives.



Bible Story

**Shadrach, Meshach,
and Abednego Stand
True**

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Castle Callout

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Materials

 door with a doorknob

 masking tape

Preschool Science

Fire Safety Relay

Preparation

Mark the starting line and a finish line on the floor with masking tape.

Experiment

Have the Knights stand by the starting line.

SAY: In our Bible story today, Meshach, Shadrach, and Abednego were put in a hot fire. Fire is dangerous and can hurt us badly. Let's learn some things we can do to help us stay safe if we are ever in a fire. One thing we can do is gently touch a doorknob with the back of our hand to make sure it's not too hot to open.

SAY: **"Go!"** and have the Knights walk quickly to the doorknob, gently touch the doorknob with the backs of their hands and walk back to the starting line.

SAY: **Something else we can do to help us stay safe is to crawl under the smoke to a safe place. Let's practice crawling.**

SAY: **"Go!"** and have the Knights crawl to the finish line and back.

Have the Knights spread out in between the start and finish lines.

SAY: **A third thing we can do is "Stop, Drop, and Roll!" Let's try it.**

SAY: **"Go!"** and have the Knights drop and roll.

SAY: **God sent help to Meshach,**

Shadrach, and Abednego in the fiery furnace. God helps us through people who learn how to stay safe and then teach us how to be safe.