



The Almighty Can Crusher - Science Devotion - Almighty

"For since the creation of the world God's invisible qualities—his eternal power and divine nature—have been clearly seen, being understood from what has been made, so that people are without excuse."

Romans 1:20

Main Spiritual Point:

Though I cannot see God, I see His power at work.

Science Concept:

By heating water inside a can to boiling, hot water vapor (steam) was produced and filled the can. The hot vapor was suddenly cooled when inverted in ice water. Cooling the can caused the water vapor in the can to quickly condense, creating a partial vacuum. The extremely low pressure of the partial vacuum inside the can made it possible for the pressure of the air outside the can to crush it. The can is crushed when the pressure outside is greater than the pressure inside, and the difference is greater than the can is able to withstand. Usually the air pressure inside an open can is the same as the pressure outside. However, in this experiment, the air was driven out of the can and replaced by hot water vapor. When the water vapor condensed, the pressure inside the can became much less than the air pressure outside, causing the air outside to crush the can.

Time Needed:

5 minutes basic set up and 10 minutes to execute the devotion with kids.

Difficulty:

Moderate. Requires the use of an open flame and hot water.

You will need:

- 2-3 empty aluminum cans (or more)
- Small amount of water inside the can
- Blow torch or hot plate
- Metal tongs
- Matches or lighter
- Large bucket of ice water or a large beaker of ice water

Tips for Success:

- Be cautious when dealing with open flame from a blowtorch or a hot plate.
- Wait for steam to visibly rise from the mouth of the can before inverting into the ice water.
- PRACTICE this demonstration several times. Aluminum cans are cheap.
- Be sure to press the can down into the ice water, ensuring the mouth of the can is fully submerged.
- Consider having enough cans for each small group member to try their hand at crushing a can.

The Almighty Can Crusher - What to Say to Kids

1. "Our theme today is 'Almighty'. We are learning about God's almighty and yet invisible power. Let's read Hebrews 11:1, 'Now faith is confidence in what we hope for and assurance about what we do not see.' We have confidence in God's power and can be confident in His abilities, even though we do not see Him."
2. "Let me read Romans 1:20 out loud. 'For since the creation of the world God's invisible qualities—his eternal power and divine nature—have been clearly seen, being understood from what has been made, so that people are without excuse.'"
3. "This verse shares two invisible qualities about God. (1) God's Eternal Power (2) God's Divine Nature. Today we will be learning about the invisible quality of God's eternal power."
4. "What does the word 'invisible' mean?" (Something that exists but cannot be seen) "Can you name some invisible things?" (God, air, wind, etc.)
5. "What does the word 'power' mean?" (Strong, ability to do work or get something done) "Can you name some things that are powerful?" (Heavy machinery that moves and pushes a lot of dirt, a tornado, hurricane or powerful storm, God, a huge football player)
6. "Let's pretend to have a contest to see who was more powerful. Me or a really strong weight lifter. How would we find out who was more powerful?" (Have a weight lifting contest and whoever could lift more would be more powerful) "So we would know who was more powerful by WHAT THEY COULD DO and how much they could lift, right?"
7. "God is powerful. We know He is powerful because of what He has done. God has created the world. We know He is powerful by what He has done and by what He made. What are some things God has done, created or made that prove He is powerful?" (Creating mountains, making powerful storms, Jesus speaking words and stopped powerful storms, making the sun/moon must have taken a lot of power) "Let's read Psalm 19:1-4. Nature and what God created are telling us a secret message – 'Someone very powerful made what you see!' Trees and mountains do not use words, but they point to God!
8. "Unlike a weight lifter who we can see, God is invisible. We cannot see Him, but we see how powerful He is by what He does." (Consider re-reading Romans 1:20)
9. "Can I have a volunteer? I need someone to use his or her power to crush this can. WOW! Could a newborn baby do what you did? No way! You are more powerful than a newborn baby. Also, you are not invisible and we can see you. We just saw you use the power of your muscles to crush a can."
10. "At this time, I am going to use an invisible power of science and nature to crush this can. The can is empty except for the air inside and a small amount of water we have placed inside." (Hold the can with your tongs and shake the can side to side to demonstrate the sound of the water inside)
11. "Let's add heat to make the water inside boil. The steam has pushed out all the regular air from the can and the steam completely fills the can and is coming out of the opening." (Wait for steam.)
12. "The molecules of steam are hot and moving very fast. Notice I have a container of ice water. I am going to turn over this can filled with hot steam and plunge it into the ice water. Ready, set, GO!"
13. "Wow! The can was crushed but I did not use my own muscles to crush it. Let's try that again." (As you are heating a second can, read or summarize the "Science Concept" section of this devotion)
14. "The invisible force of air pressure actually crushed this can! The can was crushed quickly and completely and yet no one's hand did the crushing. There was an invisible and powerful force that crushed the can. This can was crushed faster and crushed more completely than our volunteer!"
15. "God is Almighty. God is extremely powerful. God has done amazing and powerful things that no human could possibly do. God is stronger than any person and is stronger than anything. Yet, just like our the invisible power of air pressure that crushed our can, God is also invisible. We know that air pressure crushed the can, though we cannot actually see the air molecules push in to smash the can."
16. "The Bible teaches us that God's invisible power has been shown by what He has created and by what He has made. God's ability to make the universe, His ability to make you and your friends shows how powerful He really is. One way to know God exists is to look around at nature and what has been created. Looking at nature leaves us only one conclusion – God exists and God is powerful."

