



Grade Level: Grade 4

Title:

Dripping Water Effects & Acquiring Virtue

Denomination: Catholic

Lesson ID: ES-G4-02-CA

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Note: Web sites referenced in this lesson were valid at time of publication.

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EARTH SCIENCE - GRADE 4 - CATHOLIC

LESSON 2 – Effects of Dripping Water and How to Acquire Virtue

NOTE: The effect of this lesson is best achieved when the students actually do the experiment.

CONCEPT: Little forces can produce big changes slowly.

SCIENCE CONCEPT

Dripping water can change the earth's surface.

GOAL OF SCIENCE LESSON

Student will know the effect of dripping water in caves.

OUTCOME EXPECTED

Student will be able to name and describe stalactites, stalagmites, curtains and columns as cave formations.

MATERIALS NEEDED

- Pictures of cave formations - use textbook and see Links.

RELIGION CONCEPT

Change and growth in our faith can occur from practicing one good choice at a time.

GOAL OF RELIGION LESSON

Student will be able to define “virtue” and how to acquire virtues.

OUTCOME EXPECTED

Student will begin to consciously pray and do good actions to begin to acquire virtue.

MATERIALS NEEDED

- Religion notebooks or journals
- Pen/pencil

- Science Journal Page: DRIPPING WATER IN CAVES
- Eye droppers – one for each group
- Thick glue (may have to dilute a very little bit – just enough that the glue slowly drops from the eyedropper)
- pen/pencil
- Large rock – one for each group. Large enough so that the glue dropping will definitely hit the rock each time.
- Plastic sheets or waxed paper under and around each rock
- One Week Behavior Record hand-out – Teacher Created. (See Links for suggestions)

SCIENCE METHODOLOGY

- **HAVE** the student predict what effect dripping water on or near the earth's surface will cause.
- **RECORD** prediction on the Science Journal Page.
- **SAY:** Dripping water can either wear down or build up a surface.
- **DISTRIBUTE** the cave formation pictures. Have the students examine them identifiable formations.
- **DEFINE** –Stalactite: cave formation hanging from the

RELIGION METHODOLOGY

- **SAY:** Think of some really good choices you have made in the recent past. (Insist that the student take time to think before answering.)
- **DISCUSS** some of the good choices. Record on the board.
- **SAY:** So you have made some conscious choices to do good. When we choose to do the right thing, we are practicing VIRTUE.
- **WRITE** the word “VIRTUE” on the board.

Ceiling. NOTE: C in stalactite = ceiling

- **HAVE** the student write the word and definition on the Science Journal Page. Draw a stalactite.
- **DEFINE:** “STALAGMITE” – a cave formation building up from the ground. Notice the G in the word. Usually the formation is pointed up to the cave ceiling.
- **WRITE** the word and definition on the Science Journal Page. Draw a picture of the Stalagmite.
- **DEFINE:** Cave Curtain – a cave formation made when several stalactites grow together. Note that the “C” is for Cave Ceiling.
- **WRITE** Curtain and the definition on the Science Journal Page and draw a Cave Curtain.
- **DEFINE:** Column – a formation that forms when a stalactite and a stalagmite grow toward each other until they meet.
- **WRITE** Column and the definition on the Science Journal Page and draw a Column.
- **REVIEW** all the terms.
- **SAY:** Now let’s have some fun with cave formations.

- **DEFINE** the word virtue. A virtue is like a spiritual muscle which helps you move toward Jesus.
- **SAY:** There are three Theological (God-centered) Virtues: Faith, Hope, and Love. We believe in God; we hope in God; we love God and because of that, we love others.
- **WRITE** the Theological Virtues on the board.
- **HAVE** the student write the term and the names of the three virtues in Religion Notebook.
- **SAY:** There are Four Cardinal Virtues: Prudence, Justice, Fortitude and Temperance. These are the “hinge” virtues because we need them to open the door so other virtues can be learned easily.
- **DEFINE** the Four Cardinal Virtues”
 1. **Prudence:** thinking through things before making a decision; doing the good thing wisely.
 2. **Justice:** dealing fairly with every person.
 3. **Fortitude:** courage when we could take the easy way out.
 4. **Temperance:** moderating or limiting our wants to keep a good balance in our life.

- **DIVIDE** the class into groups.
 1. **Ask** each group to place the piece of plastic or waxed paper on the desk or table.
 2. **Have** them place the rock in the center.
 3. **Give** each group a container of the glue (suitably diluted) and an eye dropper.
 4. **Have** them hold the eye dropper at about shoulder height and drop the mixture one drop at a time on the rock. Count to 30 slowly between drops.
 5. **Variation:** You can add food coloring to the glue. Explain that sometimes the different minerals in the cave ceiling or in the ground above the cave would tint the water.
- **CONTINUE** the experiment until the beginning of a stalagmite is formed on the rock. Have the student sketch the formation on the Science Journal Page.
- **POSIT:** Dripping water can cause changes to the surface and near surface of the earth.
- **SAY:** These are some of the virtues – ways of living to be more like Jesus – What virtues have you already begun to practice?
- **DISCUSS** their list of recent good choices.
- **GIVE** each student the ONE WEEK GOOD BEHAVIOR RECORD hand-out.
- **ASK** them once during the day to write down all the good choices they have made.
- **SAY:** Just like dripping water builds cave formations like stalactites and stalagmites, practicing good actions builds virtue.
- **REVISIT** the Good Behavior Record in one week and discuss what virtues they have begun to acquire.
- **PERHAPS** post the Virtue of the Week in your room the rest of the year.
- **POSIT:** We can become more like Jesus by doing good actions one by one.

RESOURCES AND LINKS

Science Links

(Teacher) Pictures of cave formations in Carlsbad Caverns, NM to print and copy for student study. Go to web site. Scroll down left side to CAVES, click, select Carlsbad Caverns. On right side click on 6 photographs.

<http://www.americansouthwest.net>

(Student) On-line interactive puzzles, experiments, quizzes and more.

http://www.cavern tours.com/KIDSPAGE_Home.html

(Teacher) Great information on Caves including a different experiment using dissolving rather than building up a formation.

<http://www.cavern tours.com/cgp1.htm>

(Teacher) Free pictures of cave formations in Carlsbad Caverns, NM.

www.freenaturepictures.com/cave-rock-pictures.php

(Student) Kids explore a cave; watch a video

<http://pbskids.org/dragon/flytv/show/caves/html>

Religious Links

(Teacher, then student) Search CHOICE GAME: Choice and Consequence Game. Click on First Game. Moves pretty fast. Slow readers may need help.

<http://www.faithfirst.com/html/famil/games/games.html>

(Student) Click on Color God's creation. To play, click on an object and then make a choice.

www.faithfirst.com/html/kidClub/games/colorcreation.html

(Student) Colors of the Italian Flag stand for the Virtues:

<http://www2.lhric.org/pocantico/italy/flag.htm>

**KEY WORDS – EARTH SCIENCE – GRADE 4
LESSON 2 – CATHOLIC**



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SEDIMENT
SOLUTION
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COLUMN
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