



*Grade Level: Grade 4*

*Title:*

## **Be A Scientist - Experimentation**

*Denomination: Catholic - Christian*

*Lesson ID: BAS-G4-01-CACH*

**Contact Info:**

Exploring the World, Discovering God (EWDG)  
Institute for Theological Encounter with Science & Technology (ITEST)  
20 Archbishop May Drive, Suite 3400A  
St. Louis, MO 63119

EWDG email: [EWDG-Info@creationlens.org](mailto:EWDG-Info@creationlens.org)

EWDG web site: [www.creationlens.org](http://www.creationlens.org)

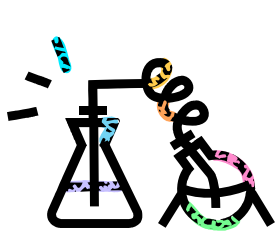
ITEST web site: [www.faithscience.org](http://www.faithscience.org)

Ph: 314.792.7220

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

Copyright by Exploring the World, Discovering God (EWDG), a pilot program of Institute for Theological Encounter with Science & Technology (ITEST). All rights reserved. The contents, or parts thereof, i.e., lessons/modules, may be reproduced for classroom educational use only. Any reprinting or reproducing for the purpose of sale is prohibited, and if done, party is subject to all legal sanctions.

© ITEST © EWDG



## **BE A SCIENTIST – GRADE FOUR – EXPERIMENTATION**

**SCIENCE SKILL:** Experimentation

**GOAL OF LESSON:** The student will know that scientists conduct experiments.

**OUTCOME EXPECTED:** The student will be able to safely use the science skill of experimentation.

**MATERIALS NEEDED:**

**BOTH OPTIONS:**

- Card stock or light cardboard for cover and back of Science Journal. Teacher may choose any style notebook or decorations that fits the class
- Crayons or markers
- Pencil
- Laminating machine
- Rings or yarn

### **OPTION 1: CHICKEN WING EXPERIMENT**

- Raw chicken wings – one per student
- Bleach to soak chicken wings
- Plastic gloves for students
- Trash cans
- Plastic sheeting or waxed paper for desks
- Hand-washing materials and facilities
- Sharp scissors for teacher to help students
- Science Journal Page: EXPERIMENTATION – PUSH-PULL MUSCLES

### **OPTION 2: SOLUBILITY**

- Stations set up with the following equipment:
- Clear pitcher – 2 quart or larger per group – preferably plastic
- Water in each pitcher – about 2 quarts – Fill the pitchers before class
- Five packets of Kool-aid or a container of powdered lemonade per group
- One measuring scoop for the powdered lemonade
- Long handled spoon for stirring per group

- Science Journal Page: Be A Scientist – Experimentation – Solubility

## **MTHODOLOGY**

**BOTH OPETIONS: Teacher should select whatever method for making or adapting existing Science Journals that best fits the class. It can be a three ringed binder, a spiral notebook, or as below:**

- **SAY:** We are going to begin this year by making our Science Journals. We will all our Science papers in it.
- **BE SURE** to give clear directions for what is to be on the front cover (Name and Grade, the words “Science Journal”) Students can draw pictures on the cover, cut out pictures from magazines or bring in pictures from home.
- **ALLOW** time for the covers and backs and send them to the office or take them to be laminated.
- **WHEN LAMINATED**, have the student fasten them with yarn or rings.

## **OPTION ONE: PUSH/PULL WITH CHICKEN WINGS**

- **SAY:** We want to learn how to be scientists. During the last three years, you probably did some observing...you watched things to see what would happen and you did some predicting...thinking about what would probably happen; you also made some comparisons...how things were alike and different. You have worked on measurements. Scientists take very careful and accurate measurements. One extra drop of something could cause an explosion! This year you are going to do some experiments.
- **ASK:** What do we mean when we say that every action has a corresponding reaction? Get the class to the definition that nothing happens without being acted upon.
- **SAY:** When you bed your arm at your elbow and let your hand hang down, it will stay there unless something acts upon it. Your other hand moves it, the muscles in that arm move it, and someone else moves it.

- **SAY:** We are going to do an experiment now to see how a chicken's arm or wing moves. Work with your partner. Put on a pair of plastic gloves. Do not put your fingers into your mouth during this experiment. Hold the chicken wing with the part that joins to the shoulder straight and the arm part hangs down. If you keep feeling the muscles in the straight piece, you will eventually find one that will move the arm back and forth. Keep trying until you find it.
- **SAY:** Now that we have found the muscle that moves the chicken wing, strip off all the skin and fat. I can help you by cutting a bit of the skin and fat if you get stuck. Keep feeling for that one muscle and don't take it off the bone. Try to take off everything around it so you can see where it is attached to the bone. When your brain sends an impulse to your muscle, it contracts and your arm moves or in this case, the chicken's arm moves. If you pull the muscle the chicken wing will move back and forth.
- **WHEN EVERYONE HAS FOUND THE CORRECT MUSCLE, SAY:** Clean up the mess, take out the trash and wash your hands thoroughly.
- **DISTRIBUTE** the Science Journal Pages. Be sure everyone has a pencil.
- **DRAW** the experiment on your Science Journal Page: EXPERIMENTATION: PUSH/PULL – CHICKEN WING

## **OPTION 2: SOLUBILITY**

- **SAY:** We want to learn how to be scientists. During the last three years, you probably did some observing...you watched things to see what would happen and you did some predicting...thinking about what would probably happen; you also made some comparisons...how things were alike and different. You have worked on measurements. Scientists take very careful and accurate measurements. One extra drop of something could cause an explosion! This year you are going to do some experiments.
- **SAY:** We have all mixed water with Kool-aid or Powdered Lemonade to make a delicious cold drink. The question today is (Write on the Board) HOW MUCH POWDERED SUBSTANCE CAN WE ADD BEFORE THE WATER CAN NOT ABSORB THE POWDER?

- **ASSIGN** the students to groups of 4-5. Be sure they have their Science Journals, the Science Journal Page and a pencil. Then have them move to their stations.
- **SAY:** Solubility is the measure of the amount of a substance that can be dissolved in another substance, usually a solid in water.
- **WRITE** the term Solubility on the board.
- **HAVE** the students write the term on the Science Journal Page.
- **READ** the question again. This time we will make it specific to our experiment.
- **SAY:** The question today is: How much (Kool-Aid, Lemonade) can we add before the water can not absorb the (Kool-aid, Lemonade)?
- **SAY:** This is what we are going to do. One person in each group will be the pourer. One person will be the observer. One person will be the stirrer. The rest of the students in your group will be the recorders. Does everyone understand? (Either select the students for the jobs or let the group decide.)
- **SAY:** The **first step** is to open the first packet or open the lemonade container. The pourer should do this. Do it now.
- **SAY:** The **second step:** The pourer should gently pour the packet of solids into the water or the one scoop of lemonade gently into the water. Let the powder settle to the bottom. Do it now.
- **SAY:** The **third step:** The stirrer should put the spoon in the pitcher and gently stir the water and powder until all the powder is absorbed.
- **SAY:** The **fourth step:** The observers should watch carefully and let the stirrer know when all the powder is dissolved into the water.

- **SAY:** The **fifth step:** The recorders should write down Packet # 1 or Scoop # 1 and write down if it was absorbed into the water. Yes or No.
- **SAY:** REPEAT the steps 2-5. If all the powder is absorbed, do the experiment again. Keep repeating until the observer says that the powder did not dissolve.
- **HAVE** the stirrer stir the water rapidly to be sure all the powder will not dissolve. If it will not dissolve, we have reached the Solubility limit of this amount of water.

#### **FOR BOTH OPTIONS:**

- **POSIT:** An experiment helps a scientist learn how things work and why they work.

#### **RESOURCES AND LINKS**

(Teacher) A lesson on building an arm  
<http://www.terc.edu/newsroom/939.html>

(Teacher) Information on Children's Dissection workshops offered for 2-03 graders  
<http://www.dmns.org/main/en/General/Education/FamilyChildrensWorkshops/Programs/JuniorSurgeons.htm>

(Teacher Picture and a bit of information on chicken wing dissection  
<http://www.bio.txstate.edu~scied/General/Swtsvips.html>

## 6. *Your Joints and Muscles*

Students assemble a model of a human leg muscle system, observe how muscles make movement possible, and examine chicken wings.

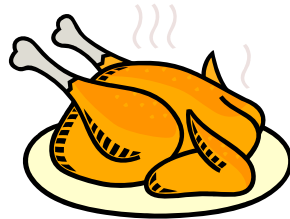




**KEY WORDS – LIFE SCIENCE – GRADE 4**  
**BE A SCIENTIST – EXPERIMENTATION – CA/CH**

**EXPERIMENTATION**

**SCIENCE JOURNAL**



**PUSH**  
**PULL**  
**ACTION**  
**REACTION**  
**MUSCLE**  
**BONE**

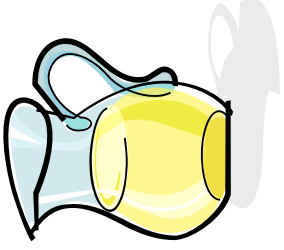
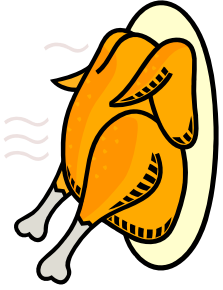


**SOLUBILITY**  
**SOLUTION**  
**ABSORB**  
**DISSOLVE**  
**SOLID**  
**LIQUID**

**KEY WORDS – LIFE SCIENCE – GRADE 4**  
**BE A SCIENTIST – EXPERIMENTATION – CA/CH**

**EXPERIMENTATION**

**SCIENCE JOURNAL**



**PUSH**

**SOLUBILITY**

**PULL**

**SOLUTION**

**ACTION**

**ABSORB**

**REACTION**

**DISSOLVE**

**MUSCLE**

**SOLID**

**BONE**

**LIQUID**