

Electrochemistry Grade 4 Evaluation

Teacher Section

Overview: Kids will demonstrate how well they understand important key concepts from this section.

Suggested Time: 45-60 minutes

Objectives: Students will be tested on the key concepts of electrochemistry:

1. There are different kinds of conduction, such as metallic conduction, where electrons flow through a conductor (like metal) and electrolysis, where charged atoms (called ions) flow through liquids.
2. Electrolytes are a substance (like salt) that becomes a conductor of electricity when dissolved in a solvent (like water).
3. This type of conductor is called an "ionic conductor" because once the salt is in the water, it helps along the flow of electrons from one clip lead terminal to the other so that there is a continuous flow of electricity.
4. Metals are conductors not because electricity passes through them, but because they contain electrons that can move.
5. Batteries need electrodes made of two dissimilar conductive materials, like metal.

Students will also demonstrate these principles:

6. Design and build a simple battery.
7. Know chemical energy can be converted into electrical energy.

Materials (one set for entire class)

AA battery case
2 AA batteries
2 alligator wires
Distilled white vinegar
Disposable cup
Salt
Sugar
2 Pennies
2 Nails
2 Pieces of plastic
2 Popsicle sticks
Digital Multimeter

Lab Preparation

1. Print out copies of the student worksheets, lab practical, and quiz.
2. Have a tub of the materials in front of you at your desk. Kids will come up when called and demonstrate their knowledge using these materials.

Lesson

The students are taking two tests today: the quiz and the lab practical. The quiz takes about 20 minutes, and you'll find the answer key to make it easy to grade.

Lab Practical

Students will demonstrate individually that they know how to build a battery and explain how chemical energy can be converted to electrical energy. While other kids are waiting for their turn, they will get started on their homework assignment. You get to decide whether they do their assignment individually or as a group.

Homework Assignment

Your classroom is going to be converted into an interactive science museum next week by your students. You can invite parents, teachers, lower grade levels, and a camera crew. This is fun, informative, and really gives the kids the credit they deserve for working so hard to learn this science stuff. And they get to do all the work. You're just the consultant. It's really the icing on the teacher's cake.

Here's their assignment: Students will be in charge of one of the stations. Their audience knows nothing about electricity. Their job is to design and build an experiment that teaches the students in lower levels an important concept in one of the following areas: static electricity, electricity, or electrochemistry. They'll get to explain what's going on as they demonstrate their experiment. Your students can have the audience just watch or actively do something at their station. Grade your students based on content and creativity (50-50 split), so really encourage their minds to go wild and try something new mixed with what they already have mastered.

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Student Worksheet

Overview: Today you're going to take two different tests: the quiz and the lab practical. You're going to take the written quiz first, and the lab practical at the end of this lab. The lab practical isn't a paper test – it's where you get to show your teacher that you know how to do something.

Lab Test & Homework

1. Your teacher will call you up so you can share how much you understand about electrochemistry and how it works. Since science is so much more than just reading a book or circling the right answer, this is an important part of the test to find out what you really understand.
2. While you are waiting for your turn to show your teacher how much of this stuff you already know, you get to get started on your homework assignment. The assignment is due next week, and half the credit is for creativity and the other half is for content, so really let your imagination fly as you work through it.

Here it is: Your classroom is going to be converted into an interactive science museum next week. You will be in charge of one of the stations. Your audience knows nothing about electricity. Your job is to design and build an experiment that teaches the students in lower levels an important concept in one of the following areas: static electricity, electricity, or electrochemistry. You will get to explain to your students what's going on as you demonstrate your experiment. You can have them watch or actively do something at your station. You will be graded based on content and creativity, so really let your mind go wild. (Hint: If you were the audience, what would *you* want to learn about most?)