

Even and Odd Numbers Closure Activity – Lesson Plan

Lesson Overview

This activity is good for introducing the concept for closure. It can also be used to reinforce the definitions of even and odd numbers. This activity explores whether the even numbers or the odd numbers are closed under addition and multiplication. We will see that the even numbers are closed under addition, while the odd numbers are not. This demonstrates that not all sets of numbers are closed under the same operation. However, both the even numbers and odd numbers are closed under multiplication. For younger grades, this activity can be done without the multiplication tasks.

Lesson Materials

- A copy of the Even and Odd Numbers Closure Activity worksheet for each student.
- Optional: manipulatives to model even and odd numbers.
- Optional: a calculator, perhaps for students to add very large even numbers.

Lesson Introduction – Whole Class

1. Review the definition of even and odd numbers. For younger children, you may want to model these definitions using manipulatives.
2. If appropriate, review addition of whole numbers.
3. Introduce the word “closure”. Closure occurs when something is done to two things of the same type and the result is the same type of thing. Some non-mathematics examples include
 - Apple juice and cranberry juice or both fruit juices. If they are mixed together, the result – apple-cranberry juice – is still a fruit juice. Thus, mixing fruit juices is closed.
 - Hydrogen and oxygen are both gases. But if they are combined in the right way, they form water (H_2O), which is not a gas. Since, combining gases does not always result in a gas, combining gases is not always closed.
4. Closure in mathematics occurs when you have a set of things, such as a set of numbers, and when you do an operation on two numbers, the number that results from the operation is from the same set as the original two numbers. The sets of numbers for this activity are the even numbers and the odd numbers. The operation is addition.
5. Have students do the Even and Odd Numbers Closure Activity worksheet. You may want the students to work in groups and bring the class together to discuss the tasks at various times.

Worksheet Solutions, Discussion, and Extensions

Task 1A

Describe how you can tell that 6 and 8 are even numbers.