Integer Expedition: Conquering Positive and Negative Numbers!

Materials Needed:

- Whiteboard or large sheet of paper
- Colored markers (at least two distinct colors)
- A number line (can be drawn by hand, printed, or a physical one like a ruler)
- "Integer Cards": Index cards or small pieces of paper with various integers written on them (e.g., numbers from -10 to +10, including duplicates)
- "Operation Cards": Index cards with '+' and '-' symbols
- "Mystery Integer Problems": A list of pre-written word problems involving integer addition and subtraction
- Optional: Small counters like beans or buttons (two different colors to represent positive and negative units)
- Optional: Computer or tablet with internet access for online games

Ahoy, Indie! Welcome to the World of Integers! (5-10 minutes)

Today, we're going on an expedition to explore integers! Integers are like a secret code for numbers that can be positive (like earning $5), negative (like owing someone $3 or the temperature dropping 3 degrees), or even zero (like having no cookies left – sad, but still an integer!). They are whole numbers, their opposites, and zero. No fractions or decimals allowed in the integer club!

Imagine a giant thermometer or a Treasure Map with a line: that's our number line! Zero is our starting point. Numbers to the right are positive (like steps forward), and numbers to the left are negative (like steps backward). We'll use this map a lot today!

Activity 1: Integer Card Shuffle – The Addition Game! (15-20 minutes)

Goal: To become a pro at adding integers!

How to Play:

1. Shuffle your Integer Cards.
2. Draw two cards. These are your numbers to add.
3. **If the signs are the SAME (both positive or both negative):** They're on the same team! Just add the numbers together and keep their team's sign. Example: (+3) + (+4) = +7 (The positive team gets stronger!). (-2) + (-5) = -7 (The negative team gets stronger in the negative direction!).
4. **If the signs are DIFFERENT (one positive, one negative):** It's a tug-of-war! Find the difference between the numbers (subtract the smaller absolute value from the larger absolute value). The sign of the number with the bigger absolute value (the one further from zero) wins! Example: (+6) + (-2). The difference is 4. Since +6 is 'stronger' (further from zero) than -2, the answer is +4. Another: (-8) + (+3). Difference is 5. Since -8 is 'stronger', the answer is -5.
5. Use your number line or the colored counters to visualize this! Red counters for negative, blue for positive. See how many pairs cancel out if you have different signs.
6. Try at least 10 combinations!

Activity 2: The Great Integer Transformation – Subtraction as Sneaky Addition! (15-20 minutes)

Goal: To master subtracting integers by turning them into addition problems!

The Secret: Subtracting an integer is the SAME as adding its opposite. We call this the "Keep-Change-Change" or "Add the Opposite" trick!

How it Works:

1. **KEEP** the first number the same.
2. **CHANGE** the subtraction sign to an addition sign.
3. **CHANGE** the sign of the second number to its opposite (if it was positive, make it negative; if it was negative, make it positive).
4. Now, just add the numbers using the rules from Activity 1!

Example 1: (+5) - (+2)

- KEEP +5
- CHANGE - to +
- CHANGE +2 to -2
- So, it becomes: (+5) + (-2) = +3

Example 2: (+7) - (-3)

- KEEP +7
- CHANGE - to +
- CHANGE -3 to +3
- So, it becomes: (+7) + (+3) = +10 (Taking away coldness is like adding warmth!)

Practice with your Integer Cards and an Operation Card. If you draw a subtraction sign, use the transformation trick!

Activity 3: Real-World Integer Detective, Indie! (10-15 minutes)

Goal: To use your new integer skills to solve real-life mysteries!

Grab your "Mystery Integer Problems." For each one, write down the number sentence and solve it. Think like a detective looking for clues!

Example Mystery:

- "A brave explorer is on a mountain. She starts at a base camp 100 meters above sea level (+100). She climbs up 300 meters, then descends 50 meters to find a good resting spot. What is her current altitude relative to sea level?" (+100 + 300 - 50 = ?)
- "Indie had $20. She spent $8 on a cool comic book, then found a $5 bill on the sidewalk! How much money does Indie have now?" (Hint: Spending money is like subtracting or adding a negative).

Optional Fun: Integer Games Online! (10 minutes if time permits)

If you're up for more adventure, ask your teacher to help you find some fun integer addition and

subtraction games online. Search for phrases like "integer number line game" or "adding and subtracting integers quiz." Many cool interactive games can help make these skills even stronger!

Wrap-up & Mission Debrief! (5-10 minutes)

Fantastic work on your Integer Expedition today, Indie!

Let's recap:

- Can you explain to me, in your own words, how to add two integers with different signs?
- What's the secret trick for subtracting integers?

Quick Check (on whiteboard or paper):

1. (-9) + 4 = ?
2. 6 - (-2) = ?
3. (-3) - 5 = ?
4. (-4) + (-7) = ?

You've done an amazing job navigating the world of positive and negative numbers today! Keep practicing, and you'll be an integer master in no time!