

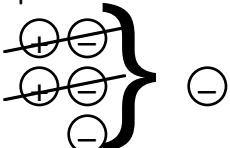
NAME \_\_\_\_\_ DATE \_\_\_\_\_

## COMBINING INTEGERS

<b>EXPERIMENT :</b>	
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<b>HYPOTHESIS :</b>	
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<b>MATERIALS :</b>	<ul style="list-style-type: none"> <li>• a plastic cup</li> <li>• 15 or more two-color markers or "beans"</li> </ul>
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<b>PROCEDURE :</b>	<ol style="list-style-type: none"> <li>1) Shake markers out on table:             <ul style="list-style-type: none"> <li>• one color = positive</li> <li>• 2nd color = negative</li> <li>• Zero pair = <math>\oplus \ominus = 0</math></li> <li>• Example: <math>2 - 3</math> means:</li> </ul> <div style="text-align: center; margin: 10px 0;">  </div> <p style="text-align: center;">so <math>2 - 3 = -1</math></p> </li> <li>2) Shake the markers out carefully 20 times.</li> <li>3) Make zero pairs to get an answer.</li> <li>4) Number each shake and write an equation for each one.</li> <li>5) When you are finished, make a t-table and place each equation on the correct side of the table.</li> </ol>
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Positive Answer	Negative Answer

<b>Equations from shakes:</b>	
1) _____	11) _____
2) _____	12) _____
3) _____	13) _____
4) _____	14) _____
5) _____	15) _____
6) _____	16) _____
7) _____	17) _____
8) _____	18) _____
9) _____	19) _____
10) _____	20) _____

Positive Answer	Negative Answer

**CONCLUSION**

A large, empty rectangular box with a black border, intended for the user to write their conclusion. It occupies the majority of the page's width and height.

## COMBINING INTEGERS: Teacher's Page

The purpose of this activity is to give students a chance to experiment with two color markers and discover when the answer is positive or negative when combining integers. Notice, I do not say "adding" or "subtracting" integers, because we are really combining "positive" and "negative" charges.

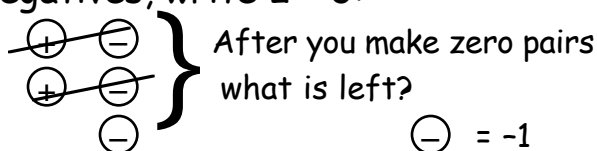
1) For each pair of students, distribute cups (plastic or paper) containing 15 or more two color markers or "beans".

2) Decide which color will be positive and which one will be negative.

Explain zero pairs on the overhead. Have students practice making zero pairs. Use this notation:  $2 - 3 = -1$  or  $-5 + 7 = 1$  or  $-4 - 3 = -7$ .

Example:

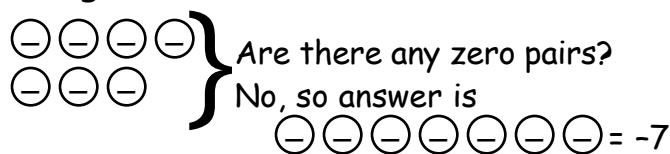
- 2 positive and 3 negatives, write  $2 - 3$ :



- 5 negatives and 7 positives, write  $-5 + 7$ :



- 4 negatives and 3 negatives, write  $-4 - 3$ :



3) Distribute experiment sheet. Have students write in the title of the experiment: ***When we combine integers, how do we know when the answer will be positive or negative?***

4) Ask them to think and write a hypothesis in that section of the experiment sheet. Explain that we are going to experiment to find out the answer and check their hypothesis. Do they have to be correct? No. If they don't know, they can write "I don't know". This part gives you an idea of the level of prior knowledge they are bringing with them.

- 5) Read the procedure, have them read along, and explain the experiment. Demonstrate how to shake the cups gently so the markers won't go all over. They will also get more variation by being gentle. If the same equations keep coming up they can add in or take out markers. Twenty shakes can sometimes be too many, so judge your class and decide whether 15 or 10 might be a better.
- 6) Discuss how to make a t-table and demonstrate placement of equations.
- 7) Now let them discover. They need to work in pairs, but both students need to make their own t-table and keep track of the equations. Walk around to ease confusion, but whenever possible direct students to the directions.
- 8) When they finish filling in the t-table, bring the class together and discuss their outcomes. Make a common t-table on the overhead or chart paper and have them fill it in with their answers. Ask them if they see any patterns and to describe the patterns they think they see. Have them discuss in a pair share.
- 9) After discussion, lead them to the rules. You want to hear "*Whenever there are more positives the answer is positive and when there are more negatives the answer is negative.*"
- 10) Have students look at their hypothesis and see how they did.
- 11) Next have them write a conclusion. (see student sample) Have them share their conclusions with other students. they can edit as they see fit.