

# Order of Operations Treasure Hunt

## Summary

The purpose of this activity is to give students the opportunity to use order of operations equations in a fun, engaging environment. During this activity, students will have the opportunity to work collaboratively as they create a treasure map and clues that are based on order of operation equations of their own design.

## Group Size

Small Groups

## Materials

Invitation to Learn

Math Journals

Invitation to Learn Instructional Procedures

Construction paper

Crayons

"Treasure"

- [Order of Operations Compass](#)

Treasure Chest

Treasure Map

Lined paper

Pencils

Parents/Volunteers

Additional Resources

Books

*Treasure Hunters- The Usborne Book of Treasure Hunting (Prospecting and Treasure Hunting)*, by Anna Claybourne, Caroline Young, Judy Tatchell, and Jenny Tyler; ISBN 0746034458

*Treasure Map (MathStart 3)*, by Stuart J. Murphy; ISBN 0064467384

*100 Puzzles, Clues, Maps, Tantalizing Tales, and Stories of Real Treasure*, by Michael Stadther; ISBN 0976061813

## Background for Teachers

The purpose of this activity is to give students the opportunity to use order of operations equations in a fun, engaging environment. During this activity, students will have the opportunity to work collaboratively as they create a treasure map and clues that are based on order of operation equations of their own design. Due to the nature of this activity, you may want to have some parents or other volunteers assist you. This activity may be done in one day or it may be broken up over a few days, whatever is most efficient for the teacher.

Before teaching this lesson, students must be familiar with the correct order of steps when performing order of operation problems. For these activities, we are going to focus on creating order of operations problems that deal with addition, subtraction, multiplication, and division. Students need to be familiar with basic multiplication and division facts and need to be taught how to use parentheses in order of operations equations.

This activity is going to require students to work in a small group setting. If students haven't had many experiences working in small groups, take the time to establish expectations about proper behavior. Many teachers like to assign group responsibilities such as group leader, scribe, material manager, and so forth when working in small groups. In this activity, the students are going to have the roles of

Map Maker, Interpreter, Guide, and Captain. The Map Maker will be responsible for drawing the treasure map, the Interpreter will write down the clues, the Guide will be responsible for getting materials, and the Captain will be responsible for keeping the group on task. This will give each student the opportunity to actively participate in the group.

As I tried this activity in my classroom, I found that students wanted to use a lot of numbers for each problem. The students need to start with simple problems that deal with addition or subtraction and then work their way towards more difficult problems that include parentheses, multiplication, and division. I would limit the amount of numbers for each problem to less than 6 numbers for the more difficult problems.

### Intended Learning Outcomes

2. Become effective problem solvers by selecting appropriate methods, employing a variety of strategies, and exploring alternative approaches to solve problems.
4. Communicate mathematical ideas and arguments coherently to peers, teachers, and others using the precise language and notations of mathematics.

### Instructional Procedures

#### Invitation to Learn

This invitation to learn is simple. Ask the students what they would do if they found hidden treasure. What would they buy, where would they go, or who would they help? Have them write their answers in their math journals. Discuss their answers as a class.

#### Instructional Procedures

Before starting this activity, draw a simple map of your room on the board. Label important features such as the door, windows, teacher's desk, and whiteboards. Then hide something in your room (it could be anything) and come up with a series of clues or steps that the students need to follow in order to find the object. These clues should focus on students doing things a certain number of times, such as "take 4 steps towards the front of the room" or "spin around 2 times and face the windows." Write the clues on the board next to the map but instead of writing "Take 5 paces north" write "Take  $(4 \times 3) + 2 = 9$  paces north". For your first three clues, come up with order of operations problems that tell how many times the students need to do something. On the rest of your clues, leave a blank space where the order of operations should go. The class will work in groups of 4 to create their own order of operation problems that equal the number in each clue.

Begin this activity by placing the treasure chest in front of the class. Ask the students, "Does anyone know what this is?" Allow the students to answer and then ask, "Who can tell me what a treasure box is?" or "What do you find inside of a treasure chest?"

Continue the class discussion by asking, "Where do you find a treasure chest? Are they easy to find?" Allow the class to continue answering and then ask, if it hasn't already been brought up, "What do you usually need in order to find a treasure chest? That's right. You need a treasure map." Hold up the treasure map so that your students can see it.

Then ask, "Do you need anything else besides a treasure map? What kind of tools and clues would make finding the treasure chest easier?"

Then explain, "Today we are going to go on a quick treasure hunt. However, instead of using the treasure map in my hands, we are going to use the map I have drawn on the board."

Pointing at the map and clues on the board say, "This is a map of our classroom. I have hidden "treasure" somewhere in our room and we need to use the map and clues in order to find it."

Divide your class into groups of 4 and assign each group member one of the following roles: Map Maker, Interpreter, Guide and Captain. Give them a few minutes to decide a team name. Point at the board and say, "The treasure is hidden somewhere in our room. Let's look at our

first clue to see if it can help us." Read the first clue to the class and then ask, "How is this clue different from regular clues?" Help the students understand that the order of operation problems need to be solved before we can do what the clue tells us.

Take this time to review the class mnemonic that you have developed and to pass out a piece of lined paper and the order of operations compass.

Have the students solve the order of operation problem as a group and then choose one student from the class to follow and do what the clues say to do as the class solves them.

Repeat this process for the next two clues.

For your next clue say, "Notice that the next clue does not have an order of operations problem or number listed. For the next few clues, I am going to give you the number and you are going to have to create your own order of operation problem that equals that number."

Start the students out with simple problems that deal with addition and subtraction. Give the students time to work on their problems and then have them trade problems with a different group.

Repeat this same process with the rest of your clues until the student finds your hidden "treasure". Allow the students to use multiplication and division to make the clues more difficult. Once you feel that the students are capable of writing order of operation problems, they can start on their own treasure maps and clues.

As students are deciding where to hide their treasure, the students should choose places that are not in classrooms or in locations that will disturb other teachers or students. (If you decide to do this activity in your school, talk to your school administrator and inform him/her what is going to be happening.)

Say, "I am going to give you 5 minutes to decide where you would like to hide your treasure. Captains make sure that your group is back on time. Once you have decided, come back to the classroom. As you come back into the classroom, the Guides will get two pieces of lined paper, one for your treasure map and the other for your clues."

When all of the students have found their spots, the next step is to develop their clues and maps. Begin this process by saying, "Now that you have found your spots, we now need to come up with clues that will lead us to the treasure. Interpreters are going to write the clues on one piece and Map Makers are going to draw a rough draft of the treasure map on the other."

"Your clues should be simple but fun. You can hop, skip, walk backwards, pace, and even army crawl towards the treasure. For example, as you go towards the treasure you could have a group 'Hop 5 times down the hall'."

"As the Interpreter is writing down your clues, the Map Maker needs to be drawing your treasure map. Make sure you label important places on the maps such as rooms, stairs, or playground equipment."

"Captains, you are responsible for taking care of your group. When you get done with your clues and treasure map, come back to the classroom. As you come into the classroom, Guides need to get a piece of tan construction paper to draw your map on."

When all of the students are back in the classroom and working on their maps, say, "Let's take a few minutes and talk about your clues. Remember that we are going to be developing order of operations problems for each clue. This will make each clue more difficult and fun to follow." Then say, "Everybody look at your first clue. As a group, I want you to come up with an order of operations problem for your first clue. Remember to use your order of operation compasses and our classroom mnemonic to make sure that each problem is solved correctly. Raise your hands when you have created your first problem and I will come and check it."

Once you have checked the first clue say, "You are now going to create order of operation problems for each of your clues." Have the students turn their papers in when they are done.

Once the order of operation problems have been checked, pass them back to each group. The

group will then write the clues on the back of their treasure maps.

When the students are finished with their maps and clues, have the group follow their own clues and map one more time. As the students are trying it out, give the students "treasure" that they can hide.

The final part of this activity will be to trade the maps and clues with other groups. The students will need to have a piece of lined paper to solve the equations as they look for the treasure.

The students will only get to keep the treasure if they show the other group their work and answers for each clue.

End this activity by having the students reflect on the following questions in their math journals.

Write the following questions on the board. "What did you learn from this activity?" "What was the most difficult part of this activity?" "What was the most enjoyable part of this activity" "Did this activity help you understand order of operation problems? How?"

## Extensions

### Curriculum Extensions/Adaptations/ Integration

Advanced learners can work with learners with special needs as student tutors.

Order of operation clues can be made more difficult.

This activity can be adapted to meet the needs of learners with special needs by simplifying the amount or difficulty of each clue.

This activity can be integrated into writing as students write a fictional story about them finding a treasure map.

Students can research the history of treasure maps.

Find books and stories that deal with treasure maps.

### Family Connections

Students can make treasure maps of their room, yard, or home.

Students can study maps with their parents and discuss how to read them correctly.

Invite parents into the classroom to help with this activity.

## Assessment Plan

Collect and read the students' math journals.

As students are developing their order of operation problems, informally assess if they are doing them correctly.

Listen to student discussion during cooperative learning.

## Bibliography

### Research Basis

Millis, B.J. (2002). Enhancing learning-and more! through cooperative learning. Idea Paper # 38. The Idea Center, 211 South Seth Child Road Manhattan.

In this article, Millis explains the power and effectiveness of cooperative learning. Not only is cooperative learning an effective teaching strategy, it "promotes a shared sense of community" in the classroom because "learning, like living, is inherently social." As students learn to work together through cooperative learning, they develop trust with each other and are given an opportunity to develop self-efficacy. As teachers come to understand how to implement cooperative learning, "student learning can be deepened, students will enjoy attending classes, and they will come to respect and value the contributions of their fellow classmates."

Willis, J. (2007). Cooperative learning is a brain turn-on. *Middle School Journal*. March pgs. 4-13

Judy Willis states in her article that research has shown that "in math collaboration, students learn to test one another's conjectures and identify valid or invalid solutions." This happens because cooperative learning provides students with the most opportunities to ask questions, express ideas

and opinions, and come to conclusions that they might not otherwise have through whole group instruction. Teachers can increase student understanding and involvement by increasing the amount of cooperative learning in their classrooms.

Authors

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