

# NUMBER LINE, OFFLINE ACTIVITY 1

## Lesson Plan: Number Line, Number of Steps, Activity 1

### OVERVIEW OF THE ACTIVITY

This activity introduces a version of the Treasure Hunt game and demonstrates the rules of this game.

### DESCRIPTION OF THE ACTIVITY

Students are given instructions concerning how to walk along a line in a quest to discover a "buried treasure" in the Treasure Hunt Game. If students execute the instructions accurately, they discover the "treasure".

### PRINCIPAL LEARNING GOAL(S)

- Associate counting with a count of fleeting events such as stepping;
- Connect the meaning of "backward" and "forward" to movement along a line;
- Develop the ability of students to focus their attention and to accurately execute various movement instructions;
- Enhance the ability of students to remember numerical information.

### PREREQUISITE KNOWLEDGE AND SKILLS

This activity assumes that students have already:

- practiced counting physical objects in a set;
- learned to associate a count with a corresponding number of claps heard.

### RESOURCES FOR THE LESSON

- Long line (about 10 child sized steps) drawn on the floor with 10 marks at equal intervals (floor tiles help with equal intervals, chalk is useful for marking the line);
- Examples of instruction;
- Cards of the same look, one of which is marked as "Treasure" on the hidden (bottom) side (10 sheets of paper, gently taped to the floor).

### POTENTIAL DIFFICULTIES

May flow from:

- one of the students selected to step having difficulty counting steps as he/she moves, but the rest of the students counting aloud should aid in overcoming this difficulty, particularly if the teacher instructs the class to count slowly, before the student takes each step;
- students having a limited attention span, and hence forgetting the instruction before completing their movement, which could be helped if the teacher initially gives very simple one or two step instructions to get the student involved in the activity, and only then slowly increases the complexity of the instructions;
- students misunderstanding the directions "forward" and "backward", so if this is a question of misunderstood vocabulary, the teacher needs to demonstrate the meaning of each of these words, perhaps explaining "forward" as moving towards what one sees

ahead (or a fixed point in the room, such as the door), and “backward” as meaning moving away from what one sees ahead.

### MAIN ACTIVITY ~ 20 MINUTES

The teacher prepares for this lesson by drawing a line on the floor with 10 marks at equal intervals. The distance between two adjacent marks should be equal to the length of the step of a child. The teacher then distributes 10 cards, one at each mark. One of the cards is marked as a "treasure" on the hidden (bottom) side. At the beginning of the lesson the teacher explains that there is a treasure hidden under one of these ten cards and that she will give instructions as to how to walk to reach the treasure. Students need to listen carefully, remember the instructions and then to follow the instructions. The teacher then demonstrates and emphasizes that each time she takes a step, her foot is beside a mark. She also emphasizes that her instructions must be followed exactly, including requested pauses.

This activity is carried out in a number of steps that are listed below:

- Select two students and ask them to stand on each side of the left end of the line, facing along the line. Note that we suggest that two students play at the same time so that: 1) more rapidly all students will have a chance to actively participate; 2) while in the first few games the two students will be given the same short instruction, the teacher can change mode of instruction, deliver different instructions to each student, and increase the complexity of the instructions over time. See Appendix for examples of instructions changing in these ways.
- Each student begins executing the instruction after the teacher says "start now". Other students in class are encouraged to help by counting steps aloud in unison, and by calling out each pause in movement. When both students reach their final position, they jointly turn over the card to see if they have found the "treasure".
- The teacher shuffles the cards and distributes them again along the line. The teacher should make certain that all cards are face down so that the one which is the treasure is not visible (and was not visible during preparation). Another pair of students can begin to "step" along the line.
- Repeat this activity, perhaps in several short sessions with other lessons/activities in between. Eventually all students in the class should experience the physical movement of stepping and all students will experience, even if only as observers, the various modes of instruction and complexity - for details see Appendix.

### ACTIVITIES IN OTHER SUBJECTS

When teaching other subjects the teacher can engage students in activities that will help with this treasure hunt activity:

- in a language class the students can discuss the meaning of the word "treasure".

### TEACHER ACTIONS 15 MINUTES

Upon completion of the activity it is important to discuss with the students the concepts involved in the activity so as to consolidate the knowledge acquired and help make connections to prior knowledge. Discuss with students the following questions:

- 1) Ask students why it is important to make steps of equal length. Note that this discussion, once resolved, does not need to be repeated each time you play the game.

#### **Elements to Pay Attention To**



Anticipate that the students are likely to say "because you said so". Try to engage them in thinking "what problem would occur if we took unequal steps". This is a very difficult concept and students are likely to make statements that you don't understand. While praising them for expressing their thoughts, press them gently to clarify. You can also ask a pair of students to follow the same set of instructions, but pick the shortest and tallest children in the class and tell them to take steps that they would each normally take. Then ask the class to discuss what happened (presumably they don't end up at the same place, even though they follow the same instructions).

## APPENDIX 1: EXAMPLES OF INSTRUCTION

### Examples of sets of commands:

Suggestions: At first it is best to have both students start at the same position (at 0) and receive the same instruction. Please give one command, orally and by holding your finger in the air until they complete the action.

Over several sessions you can change how you give the direction, for example by clapping instead of holding your finger in the air. You can also change the number of directions given, or give each student instructions independently.

**The sets of instructions below are just a sample to illustrate such variation. When you are holding fingers in the air, please use your right hand, unless you are asking students to go backwards, in which case please use your left hand.**

**Set 1:** Have both students start at the same point and give them the same instructions.

- 1) Put the treasure at the 4th point.
- 2) Position both students at 0.
- 3) Say "Please take 4 steps forward" while raising your right hand and holding up 4 fingers. Keep your fingers in the air until both children have taken the 4 steps.

**Set 2:** Have both students start at the same point and give them the same instructions.

- 1) Put the treasure at the 7th point.
- 2) Position both students at 0.
- 3) Say "Please take 3 steps forward" while raising your right hand and holding up 3 fingers. Keep your fingers in the air until both children have marched off the 3 steps.
- 4) Say "Please take 4 steps forward" while raising your right hand and holding up 4 fingers. Keep your fingers in the air until both children have marched off the 4 steps.

**Set 3:** Have two students (Adam and Betty) start at the same point, give them different instructions, but the same way.

- 1) Put the treasure at the 6th point.
- 2) Position both students at 0.
- 3) Say "Adam, please take 2 steps forward" while using your fingers as before. Then say "Betty, please take 4 steps forward" while using your fingers.
- 4) Say "Adam, please take 4 steps forward", using fingers again. Say "Betty, please take 2 steps forward" using your finger as before.



**Set 4:** Have two students (Carol and David) start at the **same** point, but give them **different** directions and in a **different** way.

- 1) Put the treasure at the 5th point.
- 2) Position both students at 0.
- 3) Say “Carol, I will clap to tell you how many steps to take forward”, wait a few seconds and then clap twice.
- 4) Say “David, please take steps forward to match how many fingers I am showing” while holding up 3 fingers.
- 5) Say “Carol, please take steps forward to match how many fingers I am showing” while holding up 3 fingers.
- 6) Say “David, I will clap to tell you how many steps to take forward”, wait a few seconds and then clap twice

**Set 5:** Have two students (Edward and Frances) start at **different** points, give them **different** directions and in a **different** way.

- 1) Put the treasure at the 8th point.
- 2) Position Edward at point 2 and Frances at point 4.
- 3) Say “Edward, please take 4 steps forward” and wait until he does it.
- 4) Say “Frances, please take 3 steps forward”. Keep your fingers in the air until Frances has marched off the 3 steps.
- 5) Say “Edward, please take steps backward to match how many fingers I am showing” while holding up 3 fingers (left hand).
- 6) Say “Frances, I will clap to tell you how many steps to take forward”, then clap twice.
- 7) Say “Edward, I will clap to tell you how many steps to take forward”, then clap 5 times.
- 8) Say “Frances, please take steps backward to match how many fingers I am showing” while holding up 1 finger (left hand).

**Note that an alternative is to ask Frances at this last step what instruction you should give so that she ends up at the same place that Edward is standing at. This is a beginning for a game that you will play later where pairs of students will be asked to make up sets of instructions for others to carry out.**

## APPENDIX 2: TREASURE CARDS

### “Treasure” and “Not Treasure” Images

For each game you will need 10 cards, one for each of the number line positions: 0, 1, 2, 3, 4, 5, 6, 7, 8 and 9. We are suggesting two possibilities.

The first suggestion is to use a pair of oversized emoticons, happy face to represent “Treasure” and sad face to represent “Not Treasure”. The next two pages contain four images per page, each of which can be cut out and should fit on a 3.5” x 5” card. If you print the first page four times, and the second page once, you will have enough images for two number lines.

Alternatively, you can just print the second page, cut out one “happy face”, paste it on one card, and not paste anything on the remaining cards used, thus representing “Not Treasure” with a blank card.

The second idea is to use pictures that you find on the web of pets (cats, dogs, etc.) that you think the children might like to collect and keep. The remaining pages have some samples of such pictures. In that case, put two cards at each number line position, with blank cards at the “not treasure” positions, and two cards with pictures of pets pasted on at the “treasure” position. Then the children can keep the cards and collect them as rewards for successful participation.









