

# Adding Numbers Game, Addition and Carry up to "9"

## GRADE LEVEL

K-1

## SUBJECTS

Arithmetic addition and carry

## ESTIMATED TIME

50-minute session in arithmetic addition

["Mathematicians stand on each other's shoulders."](#)

[Carl Friedrich Gauss](#)

## OVERVIEW

The purpose of this exercise is to give students a "hands-on" fun activity that uses an educational robot to encourage participation and improves hand eye coordination as well as verbal skills with numbers.

## STATE MATH STANDARDS

A number of the state standards for many states are met by the use of these exercises for grades K-6.

## OBJECTIVES

In this series of lessons, students will

- Practice adding numbers 1-9 together
- Become familiarized with "carries" for numbers beyond 18
- Develop hand eye coordination skills
- Be able to speak out numbers aloud with confidence
- Teach students to communicate using math concepts

## MATERIALS

- Educational Robot with wireless controller (one per pupil is the ideal case)
- Popsicle sticks with the numbers 1 through 9 marked on them
- Styrofoam or paper cup
- Masking or scotch tape (to attach the cup to the robot)

- 3 lengths of “board” which consists of paper, thin cardboard or fabric 4 – 6 feet long marked with the numbers 1 – 18
- “Timesheet” Paper and pen to jot time elapsed time for the exercise completion.
- Stopwatch or timer (from a watch or laptop computer)

## SETUP

1. Lay down the three strips of paper/fabric (and attach to the floor with double sided tape if needed to prevent robot wheel slippage in an upside down “U” pattern.
2. Attach the cup to the robot by taping it and place the marked popsicle sticks in the cup
3. Place a fully charged robot (and charged controller) and place it down at the starting point. Test it to make certain the wireless remote and robot are working properly.
4. Have the student drive the robot around to gain familiarity with starting, stopping, reversing and turning.
5. There should be a teacher, teacher’s aide or mentor present to assist the pupil and if there are multiple set ups, there should be a person with each pupil.

## LESSON

1. **First, explain the “game” to the student as one of addition and carries. Pick up a stick at random and read aloud the number. Place it back in the cup. Drive the robot to the place marked on the popsicle stick and stop.**
2. **Next, have the student pick up another numbered popsicle stick, read it, place it back in the cup and add the numbers and speak aloud what that sum is, and then drive the robot to the sum.**
3. **Repeat this process of picking, reading the number and adding. When the sum exceeds “18” the pupil is to calculate the carry, say it aloud and then drive the robot to the carry of the next number line.**
4. **When all 3 boards (number lines) are completed, the student can say “Done” at which time the stop watch reader can stop the clock.**
5. **Depending on time, resources available and number of mentors present, the exercise can be repeated. The student or teacher can keep the time sheet to directly observe progress being made with each opportunity to play the “Adding Numbers Game”. Also, friendly competitions during a class period can be employed to see who had the best times or the most improved times from their first to last score.**

## VARIANT ONE : STARTING FROM A CORRAL

1. A corral (consisting of building blocks or other pieces) can be a starting point half way between the U. By starting the exercise from here this gives the pupil additional hand

eye coordination practice and other verbal cues such as “forward, reverse, turn left, turn right”.

2. The stopwatch is started when the pupil is ready with the robot placed in the corral.
3. When the full exercise is completed the pupil then drives the robot back to its corral and says “DONE!”

#### **VARIANT TWO: ADDING TO 100**

1. Create a new set of number lines that progress from 1 to 100. It can be a single line or one that wraps around. At the discretion of the teacher the numbers can be groups of 0-20, 21-40, etc.
2. Sums can also be broken down into the base 10 equivalents. For instance, as the student is moving the robot to for example, 23, they could then state that “23 is two tens and three ones”.

#### **VARIANT THREE: ADDING BY “TWOS”, “FIVES” or “TENS”**

1. As in Variant Two above, a new number line can be created consisting of multiples of two or five or by merely reutilizing the existing number line used. The popsicle sticks can be exchanged for multiples of the number (2, 5 or 10) being considered.
2. It is up to the discretion of the teacher to how high the total needs to be.

#### **VARIANT FOUR: SUBTRACTION FROM 100**

1. Create number boards starting from 100 and descending to 0. Depending on space circumstances the teacher can choose the geometric pattern which could end back to the starting point or the corral.
2. The student starts the robot at 100. As before the pupil picks a popsicle stick with the numbers 1 through 9 which is subtracted from 100, For non-English speakers the number and resultant subtracted number is spoken aloud before the robot is moved.
3. This process of subtraction is repeated until zero or less is reached where upon the timer is stopped to complete the session.

4. Another variant of the subtraction exercise can also be in “twos”, “fives” or “tens” and subtraction from ZERO “0” for higher grades or highly proficient students.

#### **VARIANT FIVE: MULTIPLICATION (and by extension addition or subtraction)**

1. Use the popsicle sticks with the numbers desired for multiplication.
2. The pupil picks two popsicle sticks, reads them aloud, and multiplies them.
3. The product is added to the sum total and the robot is moved to this number.
4. The number line maximum should represent the highest number the teacher wants the students to reach.

#### **VARIANT SIX: DIVISION (and by extension either addition or subtraction)**

1. Two cups are placed on the robot. One contains the numbers to be divided and the second cup contains sticks with the possible divisor.
2. The pupil picks both numbers and performs the division out loud.
3. The number is added to (or subtracted from) the current sum and the robot is moved that number of spaces.

#### **VARIANT SEVEN: MAKING CHANGE FROM PURCHASES**

1. In this one or two person exercise there are two number lines lined up in parallel with two robots. The first line contains the numbers 0 to the maximum number of dollars of the item. The second number line contains the numbers 0 – 99 cents. A dry erase board or children’s write/erase board from a toy store can be used for calculations.
2. There are two cups with popsicle sticks. One cup represents possible number of Dollars and the other cup represents possible number of cents (in the case that \$9.99 can be used one cup is needed).
3. The “game” begins with one robot starting from the maximum, say for example \$10 and the other starting from the cents column at 0.
4. The pupils will take turns. The “dollar” pupil removes the “dollar” popsicle and then picks up two popsicle sticks in succession from the “pennies” cup (with numbers 0-9).
5. The amount is subtracted from the total and is spoken aloud. If the answer is correct the mentor nods for the players to move their respective robots to the appropriate “dollars” and “cents” column. The dry erase board or piece of paper can be used by the team members.
6. Once moved, the procedure is repeated by having each player move the popsicle stick (s) from the corresponding dollars and cents column. The “cents” column player can perform the calculation. The respective dollar and cents robots are moved into the new position. The dollar robot is always descending from the maximum dollar amount while the cents robot may move around quite a bit.

7. Players alternate with each turn to do the calculation.
8. When the number goes negative, the game stops (and for higher grades, the negative number is calculated then both robots are moved to the 0 dollars and 00 cents position).
9. Note: Teachers may want to control the maximum number of “dollars” that can be deducted or remove the dollars cup altogether.
10. Variant: one pupil doing all the calculations and a second pupil (or mentor) moving the “cents” robot along the 0-99 cents line.
11. Variant: For group competitions, the teacher can show a list of numbers on the board and each of the teams can do their calculations and move their robots to appropriate location before going to the next number.

### **ASSESSMENT / EVALUATION**

1. Can the pupil add the numbers 1-9 together?
2. Does the pupil have hand-eye coordination ability?
3. Can the pupil calculate the “carry” beyond 18?
4. In progressive exercises, is there a measurable improvement in the elapsed time it takes to navigate the course?
5. Does the pupil enunciate the numbers in a clear and confident voice?

### **ENRICHMENT**

1. The Adding Numbers Game of 1-9 and Carries is the primary lesson and variants on the basic theme of utilizing educational robots to fully engage students and improve critical thinking.
2. With each of the variants, a pupil can gain additional progressive levels of math proficiency and language fluency in a “hands on” fun activity that encourages participation.