

## **Translating algebraic expressions**

### **Algebra**

**Goal:** Students will become familiar with the relationship between verbal expressions and mathematical symbols.

#### **NYSLS for Mathematics:**

Students will represent and analyze algebraically a wide variety of problem solving situations.

A.A.1 Translate a quantitative verbal phrase into an algebraic expression

A.A.2 Write a verbal expression that matches a given mathematical expression

#### **NCTM Standards for School Mathematics:**

Algebra strand: Instructional programs from prekindergarten through grade 12 should enable all students to

Represent and analyze mathematical situations and structures using algebraic symbols

- understand the meaning of equivalent forms of expressions, equations, inequalities, and relations;
- use symbolic algebra to represent and explain mathematical relationships

Representation Strand

Students will:

- select, apply, and translate among mathematical representations to solve problems

**Objective:** Given a mathematical expression, students will be able to translate the expression into a verbal expression, and vice versa.

**Materials:** Smart Board, worksheet, manipulative (index cards)

**Use of technology:** Teacher will use the smart board to write down examples and fill in the chart

#### **Introduction:**

Tell the students that today they will be learning about translating verbal expressions into mathematics symbols and vice versa. The teacher will tell the students knowing this will help them for later lessons though out the year, and once they learn it they can play a game at the end class if time permits.

#### **Development:**

The teacher will show the class a chart of the symbols and words for addition, subtraction, multiplication and division. As a class, the teacher will ask the students for different phrases for the words on the chart. The teacher will inform the students there they are multiple ways to translate mathematics symbols into verbal expressions, and knowing the key words/phrases from the chart will help them to translate. During the class discussion,

the students will complete the chart and use the chart to help them throughout the lesson and on the homework assignment.

After they complete the chart, the teacher will do practice problems with the class. The teacher will check for correctness and understanding. The teacher will provide students verbal expressions and algebraic expressions and the students will have to translate respectively. After correct answers are found, the teacher will have all of the students correct their answers and discuss any questions that might arise. Continue giving expressions to the class until the teacher feels they have an understanding of translations.

**Guided Practice:**

The teacher will give each student a copy of the class work worksheet (see attached.) As a class, work through one example from each section of the worksheet. The students will then complete the worksheet in their groups. The teacher will walk around and monitor the students' work. After the students have complete the worksheet, check their work and have them correct any mistakes.

If time allows, the students will be asked to come up with their own symbolic expression, and translate it into a verbal expression. The students will share their expressions with their groups.

**Independent Practice:**

For homework, the student will have to complete a worksheet on translating algebraic expressions and mathematical symbols.

**Closure:**

To close this lesson, the students will play an "I have who has" game using index cards. Written on one side of an index card will be a verbal expression and on another index card will be the symbolic translation. The students will have to match their expression and then read a new expression and match that expression and so on and so forth. If time permits the students may begin their homework assignment.

**Accommodations and Modifications:**

For students who have demonstrated early mastery, students can help other students who are having difficulty.

Provide students who struggle with translating with a chart of key words they need to know.

**Evaluation**

In addition to monitoring student progress during the guided practice and reviewing homework, students will be assessed by taking a chapter quiz. The chapter quiz will require students to show their understanding of translating verbal expressions into symbolic ones.



Name: \_\_\_\_\_

Date: \_\_\_\_\_

### **Class work: Mathematical Translations**

Answer each question following the directions. Use your translation sheet and group members to help you. When your group has completed every question, raise your hand.

#### **Part 1: Translate each written expression into a mathematical sentence.**

1. A number less than three \_\_\_\_\_
2. Ten more than a number \_\_\_\_\_
3. Three more than two times a number \_\_\_\_\_
4. A number  $n$  squared minus four \_\_\_\_\_
5. Twenty divided by a number, multiplied by two \_\_\_\_\_
6. The product of six and a number  $y$  plus fifteen \_\_\_\_\_

#### **Part 2: Translate each mathematical sentence into a written expression.**

7.  $4x$  \_\_\_\_\_
8.  $17 - x$  \_\_\_\_\_
9.  $8/n + 2$  \_\_\_\_\_
10.  $11x + 5$  \_\_\_\_\_
11.  $3n + 24y$  \_\_\_\_\_
12.  $(x - 2)/12$  \_\_\_\_\_

Name: \_\_\_\_\_

Date: \_\_\_\_\_

### Homework Worksheet

Answer each question completely. Use your Translation sheet "What does it mean?" to help you.

#### Part 1: Translate each written expression into a mathematical sentence.

1. The quotient of a number and 3 \_\_\_\_\_
2. Four more than a number  $y$  \_\_\_\_\_
3. Two more than the product of ten and a number  $x$  \_\_\_\_\_
4. Thirteen less than the product of twenty and a number \_\_\_\_\_
5. The difference of a number  $c$  and two \_\_\_\_\_
6. Nine more than twice a given number  $z$  \_\_\_\_\_

#### Part 2: Translate each mathematical sentence into a written expression.

7.  $4 + n$   
\_\_\_\_\_
8.  $n - 12$   
\_\_\_\_\_
9.  $7 + 10x$   
\_\_\_\_\_
10.  $6x$   
\_\_\_\_\_
11.  $a/2$   
\_\_\_\_\_
12.  $11x - 22$   
\_\_\_\_\_

