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WITH ANN DECHENNE



# Class Objectives



**OBJECTIVE 2** Students will learn how to identify the langauge functions of math standards.

\*for the purposes of this lesson functions will be called purposes.

# Why look at the standards for language needs? Why not just look at our assignments?

Introduction

ALL students.

- High-stakes testing is connected
- to standards, and students are
- expected to be able to perform.
- Teaching the students the
- language will help them
- comprehend the subject:
- Language Learners, Sped, and



Knowing the language requirements of the standards will help orient teachers when developing language-rich lessons.



# Common Core State Standard

In 2010 the United States education system adopted a comprehensive reform, the Common Core State Standards (CCSS), designed to assist K-12 students better preparing for college and future careers. Within the CCSS for mathematics, a subset of 8 practices focus on process and proficiency, providing students with skills to use and adapt mathematics in their daily lives. Within these subsets is a language component designed to assist students in making sense, reasoning, supporting, modeling, explaining, and being precise in computation and explanation.

# Q Oregon State Math Standards

In October 2021 Oregon State Department of Education (ODE) adopted a truncated and streamlined version of the CCSS math standards. The newly adopted Oregon mathematic standards continue to stress math language learning, and the focus on academic language in the math classroom was not diminished.

## Q National Council of Teacher of Mathematics

### According to the NCTM

Educators should center multiple modes of communication (e.g., speaking, writing, drawing, direct modeling) to simultaneously develop students' language learning and mathematics (Chval & Khisty, 2009; de Araujo et al., 2018; Khisty, 1995). Students' mathematics learning should not be put on hold as they learn English. Instead, teachers should build on students' strengths and work with support systems (e.g., language acquisition specialists) to help students gain access to mathematics while developing language proficiency (National Academies of Sciences, Engineering, and Medicine, 2018; Erath et al., 2021; Moshckovich, 2015).

### CCSS: HSF. LE.1

HSF-LE A. **Construct** and **compare** linear, quadratic, and exponential models and solve problems.

This umbrella standard suggests that there will be some compare and contrast language. However, by looking closely at the following sub-standards, more language purposes begin to appear.



Umbrella standard

HSF-LE A. Construct and compare linear, quadratic, and exponential models and solve problems \*\*\*1. HSF-LE.A.1 Distinguish between situations that can be modeled with linear functions and with exponential functions.

- a. **Prove** that linear functions grow by equal differences over equal intervals and that exponential functions grow by equal factors over equal intervals.
- b. Recognize situations in which one quantity changes at a constant rate per unit interval relative to another.
- c. Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another.

\*\*\* Standard Alpha-Numeric Identifier.

#### Analysis

Keywords in the standard that indicate the type of language purpose will be needed in lessons.

elaboration contrast as well **Prove** = argument with support sequence, description, compare contrast.

CCSS

#### **Construct** = description and maybe even

- **Compare** = compare, and there is potential for
- Quantity changes at a constant rate =
- Quantity grows or decays by a constant
- **percent** = sequence, description, compare and

# **Oregon Math Standard 21:HS.AFN.D10** CCSS: HSF. LE.A.1 Explain why a situation can be modeled with a linear, exponential, or neither function. In a given model, explain the meaning of coefficients and features of functions used, such as slope for a linear

model.

**Description and Elaboration Argument and Support Compare and Contrast** 

#### Analysis

Key words in the standard that indicate the type of language purpose will be needed in lessons.

Explain why...with....or = argument and support

Oregon

**Explain the meaning** = description and possibly elaboration.

# description compare and contrast,

Your Turn to **Identify the** Purpose language. corresponding output.

CCSS

## 8.F.A. Define, evaluate, and compare functions. 8.F.A.1 Understand that a function is a rule that assigns to each input exactly one output. The graph of a

- function is the set of ordered pairs
- consisting of an input and the

My Turn to Identify the Purpose Language. 8.F.A. D com

CCSS

8.F.A.1 Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of **ordered pairs** consisting of an **input and the corresponding output**.

# 8.F.A. Define, evaluate, and compare functions.

Your Turn to **Identify the** Purpose language.

Oregon

8.AFN.A.1 Understand in authentic contexts, that the graph of a function is the set of ordered pairs consisting of an input and a corresponding output.

### 8.AFN.A Define, evaluate, and compare functions.

My Turn to Identify the Purpose Language.

Oregon

8.AFN.A.1 Understand in authentic contexts, that the graph of a function is the set of ordered pairs consisting of an input and a corresponding output.

### 8.AFN.A.1 Define, evaluate, and compare functions.



### **Explanation of** what I chose.



This one was pretty simple since it states in the heading what the purpose is. I chose, based on the language of the standard, description, compare, and sequencing.

**Ordered pairs** = could be sequencing and description. Input and the corresponding output = compare.

# Class Recap

#### POINT 1

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Both CCSS and Oregon State Math Standards call for more of a focus on langauge.

#### POINT 2

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The language of the standard can often point in the direction of the language purpose needed to be taught.

#### POINT 3

It is not always clear, and I prefer Oregon's writing of the standards for determining the purpose. This course will help.



# ☆ de Homework Q

and: numeric identifier \*Provide the text of the standard

web addresses.

- Choose a standard (CCSS or Oregon Math)
- \*Identify the standards by the alpha-
- \*List identified language purposes for the
- standard chosen and the words that
- indicate the purpose that you found.
- See the resource page on the next slide for



resources/standards/mathematics/Pages/MathStandards.aspx

# Thank You

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## THIS ASSIGNMENT PLEASE CONTACT

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