

Lesson 02




Teach the Language of Math

WITH ANN DECHENNE



Class Objectives

OBJECTIVE 1

Students will learn 
how to identify a
language function and
explain why it is
important.



Class Objectives

OBJECTIVE 1



*For the purposes of this course I will use the word **purpose** in place of the word function. A math teacher friend of mine suggested it would serve better than function as function could be confused with the mathematical term function.



Language

*Purpose Defined



Definition



A language purpose is what we DO with the language to engage in our work, discussions, school content, etc.

In terms of school and content, the language purpose is what the standard or you as the teacher is asking the student to do.

Often purposes overlap as you will see in the coming slides.



Purposes

There are so many purposes available that it can be overwhelming. I like to stick with **five** general purposes: **Cause and Effect, Compare and Contrast, Argument and Support, Sequence, and Description and Elaboration**



Cause and Effect

Aim



When one thing prompts another to occur, there is a cause and effect link between the two.

Cause and effect are often implied in math. You add A to B and get C . The language becomes apparent in story problems and when students are asked to discuss their work.



Cause and Effect

Example

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If on Monday, Rosie forgets to set her alarm for 7:00 am and she wakes up 30 minutes later than normal, what time does Rosie wake up?

If you have 3 pieces of candy and you eat 1 piece, how many pieces will you have left?



Compare & Contrast

Aim

+

When you are looking for how things are the same you are comparing. When you are looking for ways things are different that would be contrasting.

Often students hear compare and contrast but really only ever compare but they are two separate ideas.



Compare & Contrast

Example

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Let's go with something simple for compare and contrast such as squares and rectangles. Squares have 4 sides that are the same size. Rectangles have 2 short sides and 2 longer sides.

A and B are comparable while C is different.

____ and ____ are comparable while ____ is different.





Argument & Support

Aim

+



Argument and support really could be any type of purpose that requires someone to state something then provide evidence or support to back up their statement. In math the word proof comes to my mind. When you as a teacher ask your students to justify their answer basically you are asking them to provide the support for their decision. This really is the a perfect purpose for mathematics especially with current trends towards using math in authentic contexts, STEM, and discourse in the math classroom. I am a fan.



**Argument
&
Support/Justification**

Example

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In mathematics, teachers should push students to think beyond just getting the correct answer; to get the proper solution, students must comprehend the steps involved and the underlying ideas.

In the description and elaboration section, there will be a slide that provides some sentence starters to assist students with expressing their argument and support.



Argument & Support/Justification

Example



The justification or support for the answer can come in many forms.

A student may use a sequence method:
First I ____ and I came up with ____ then I ____ and finally _____ which is the answer.

Or maybe a compare and contrast method:
____ and ____ meet the criteria but ____ doesn't so therefore_____.



Sequence

Aim



Sequencing can be used in many different ways such as explaining steps towards solving a problem or providing justification for an answer. While there are many sequences in mathematics for the purposes of this course we will be looking at simple sequencing.

Sequencing is all about one thing following another, first, second, next, then, after, finally, etc.



Sequence

Example

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Knowledge of sequencing language can aid students in explaining their process, and justifying their answers. Providing students with the words they will use to need to describe the sequence will help with comprehension. Using a script or chant can help solidify the information in the students minds.



Sequence

Example

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Knowledge of sequencing language can aid students in explaining their process, and justifying their answers. Knowledge of sequencing language can also assist with comprehension. The steps to solve the problem are: A then B, next C, and finally D.

I was able to find my answer by following the sequence A, then B, next C, and finally D.

First I _____ then _____ that led me to _____.



Description & Elaboration

Aim



Description and elaboration is all about expanding on an idea or sentence. Students often struggle with more than simple sentences. For example: How was your day? Fine. In math when asking students to describe how they came up with the answer or how they would complete the project, students sometimes need a little assistance with language.

___has ___and ____.



Description & Elaboration

Example



Description and elaboration can be used to support all the purposes. All word problems contain descriptions. As a teacher, you can ask students to use elaboration to explain their thinking.

EX: My grandmother makes 2 liters of lemonade. I drink 400 milliliters, and my brother drinks 650 milliliters. How many millimeters of lemonade does my grandmother have left? Solve the problem. Turn to a table partner and describe how you came up with the answer.

Can you elaborate...
What do you mean by...
Can you be more specific...
I wonder if...
Can you clarify the part about...
How so...

*I think it means that...
In other words...
I believe that...
It is important because...*



Indicator Words

however, but, unlike, similarly, produced, share the same, just like, on the other hand, yet, -er, -est, -er than, just as

Compare and Contrast

because, because of, caused, so, as a result of, let to, therefore, if...then

Cause and Effect

I think, I believe, in my opinion, claim, position, view, according to, in fact, argues against/in favor of, my idea, one reason that,

Argument and Support



Indicator Words

described as, contain, have, has, is, are, include, defined by, indicates, characterized by, for example, associated with, belongs, exhibits

Description and Elaboration

before, after, meanwhile, later eventually during, since, next, first, second, since, ultimately, finally

Sequence

If you google any of the functions you should find multiple lists of words that can be used and taught.

There is more

Class Recap

POINT 1



Language purpose is what we DO with the language.



POINT 2



There are many language purposes but the main ones covered here are Cause and Effect, Compare and Contrast, Argument and Support, Sequence, and Description and Elaboration

POINT 3



Lesson 3 will focus on how to identify the language purposes of the math standards.



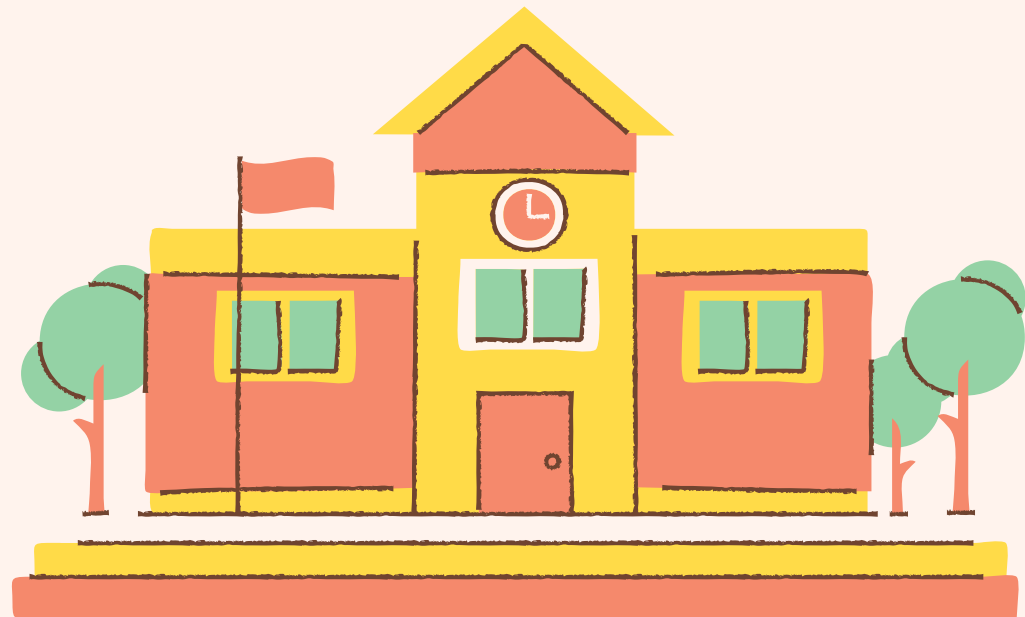


Homework

Please reflect on the presentation and the reading. Why is the purpose of language important especially in math? Was anything presented a surprise or did you have an 'aha' moment? (1-3 paragraphs)



Thank You



IF YOU HAVE ANY QUESTIONS PLEASE
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