

<u>HANDOUT 1</u>	Handout Overview
<u>HANDOUT 2</u>	My Math Experience
<u>HANDOUT 3</u>	Instructional Routines
<u>HANDOUT 4</u>	Notice and Wonder Examples
<u>HANDOUT 5</u>	Which One Doesn't Belong Examples
<u>HANDOUT 6</u>	Planning and Reflecting on Routines
<u>HANDOUT 7</u>	Learning Targets
<u>HANDOUT 8</u>	My Reflections
<u>HANDOUT 9</u>	Are You Ready for More?

Learning Goals

1. Let's learn from and with each other.
2. Let's experience some instructional routines and find out why they're in the curriculum.
3. Let's get ready to try an instructional routine with students.
4. Let's begin to "trust the curriculum".

Virtual Note Page Links

[Session 1](#) | [Session 2](#) | [Session 3](#) | [Session 4](#)

HANDOUT 2

My Math Experience

What mathematical experience(s) have framed the way **you** feel about math?

- **Great math teachers growing up**
- **Success in college (Student teaching)**
- **Classroom experiences with own students**
- **Math is like a puzzle**

What types of experiences might frame the way **students** feel about math?

- **Parent influence**
- **Seeing how their peers respond**
- **Teacher level of engagement activities for students**
- **Fearful of math; resistant**
-

Which **teacher moves** or **strategies** will positively impact your students knowing, using, and enjoying mathematics?

- **Engaging activities *****
- **Allowing productive struggle and peer collaboration to occur* *****
- **Making math applicable to the real world*****
- **The ability to share ideas with their peers**Students**
- **Reframing teachers' minds because they do not all think that all students can learn on grade level mathematics***
- **Promoting positive self-talk; math discourse and an environment that welcomes errors and opportunities to correct errors******

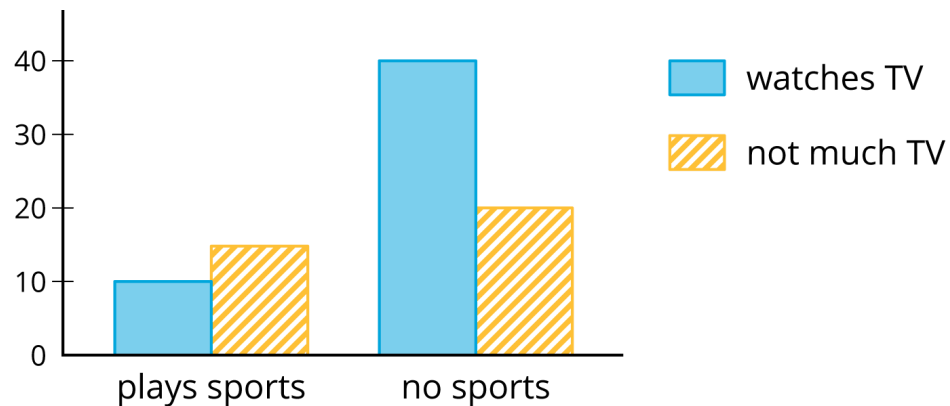
In general, incorporating the math practices and activities that instill, support and develop a growth mindset**

HANDOUT 3

Instructional Routines

What do you notice? What do you wonder?

From Grade 8 Unit 6 Lesson 9



I notice . . .	I wonder . . .
If they don't play sports, they watch more tv The scale of the graph goes from zero to 40, counting by 10s We are only comparing 2 things, playing sports and watching tv	Who was surveyed Why is there not more detail on the vertical axis to better make estimates What is the purpose of the survey

How does this instructional routine invite students to play with mathematical ideas before formalizing them?

- Every one an entry point to the problem regardless of skill set
- Opportunity to safely share
-

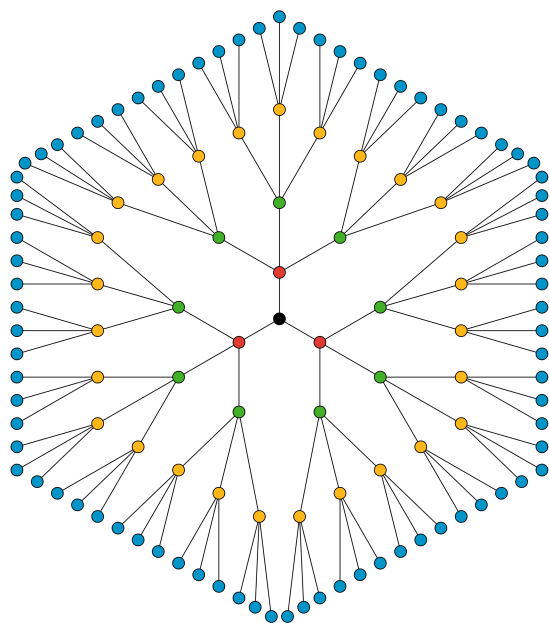
It allows students to learn from their peers as they listen to and model what is taking place during the notice and wonder process

 When I think of describing the structure of the Notice and Wonder, I think of...

-

What do you notice? What do you wonder?

From Grade 6 Unit 6 Lesson 12



I notice . . .	I wonder . . .
One black dot in the center and everything is branching off of that center point Different colors with each branch, seems to have some sort of pattern The number of dots and lines decrease as you approach the center. It looks like it is in groups of 3 each time	Is it an art installation? Maybe it is a germ or something scientific? Is the start in the middle or is the start on the sides?

Which one doesn't belong?

From Grade 7 Unit 6 Lesson 6

$4(x + 3) = 9$	$4 + 3x = 9$
$4 \cdot x + 12 = 9$	$9 = 12 + 4x$

C doesn't belong because the constant and coefficient do not match the other equations. Students might say that A doesn't belong because of the parentheses. They may say that B doesn't belong because it's the only one with the dot multiplication symbol. They may say the D equation doesn't belong because the 9 comes first.

The others are equivalent, but C is not. If you distribute A, then it becomes the same as D

A because it has parentheses

B because it has a dot

It is also equivalent to B with the operations on the LHS

D is different because the 9 is on the LHS

A uses the distributive property

How does this instructional routine invite students to listen to, respond to, and value each other's thinking?

- It reminds me a lot of the NaW, it provides an opportunity for students to safely share
- They could have picked any of the 4, so there isn't a wrong answer, but you do have to justify
- It broadens everyone's thinking. If one student didn't think of something, then it values someone who thought differently.
- It helps Ts understand thinking of the Ss in the classroom, there is more than one way to look at a problem.
- I think Ts wish they had these kinds of strategies, to elicit this kind of discussion
- Provides opportunity for Ts to get away from being the "sage on the stage" safely and often

Here are four questions about the population of Alaska.

From Grade 6 Unit 8 Lesson 7

Which question does not belong? Be prepared to explain your reasoning.

1. In general, at what age do Alaska residents retire?
2. At what age can Alaskans vote?
3. What is the age difference between the youngest and oldest Alaska residents with a full-time job?
4. Which age group is the largest part of the population: 18 years or younger, 19–25 years, 25–34 years, 35–44 years, 45–54 years, 55–64 years, or 65 years or older?

HANDOUT 4

Notice and Wonder Examples

Notice and Wonder Routine

1. Arrange students in groups of two.
2. Display an image, table, graph, expression, equation . . .
3. Give students 1 minute of quiet think time.
4. Ask students to give a signal when they have noticed and wondered something.
5. Give students 1 minute to share what they noticed with a partner.
6. Chart student responses on a two-column table with labels “I notice” and “I wonder”.
7. After all responses have been recorded without commentary or editing, ask students, “Is there anything on this list that you are wondering about?”

What do you notice? What do you wonder?

From Grade 6 Unit 6 Lesson 17

Lin and Jada each leave school at 3 p.m. to walk to the library.
They each walk at a steady rate. When do they arrive?

What do you notice? What do you wonder?

From Grade 6 Unit 7 Lesson 1

Memphis, TN
Saturday 5:00 PM
Light Rain Showers



37°F

3°C

Bangor, ME
Saturday 6:00 PM
Partly Cloudy

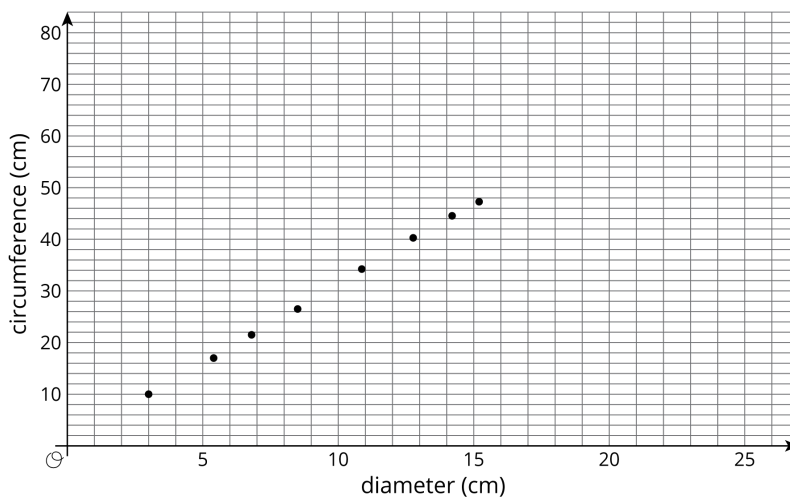


1°F

-17°C

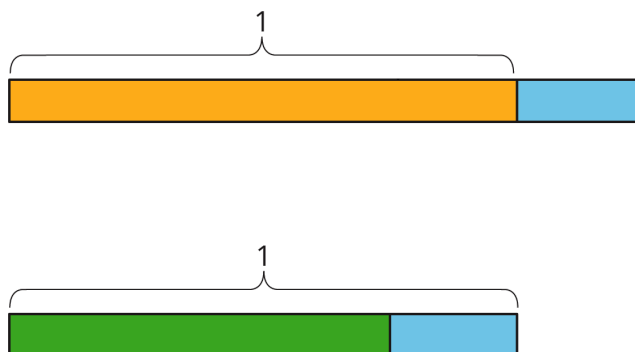
What do you notice? What do you wonder?

From Grade 7 Unit 3 Lesson 3



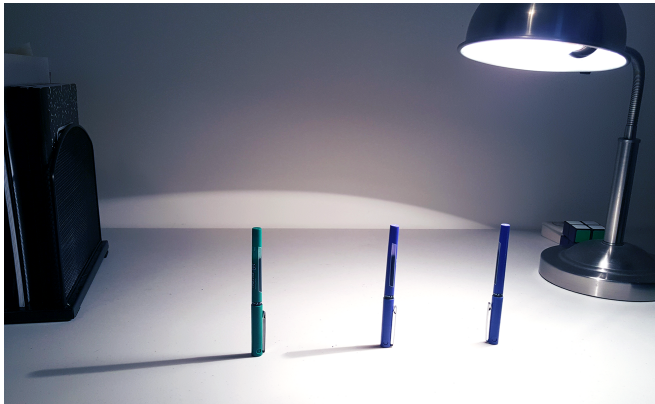
What do you notice? What do you wonder?

From Grade 7 Unit 4 Lesson 4



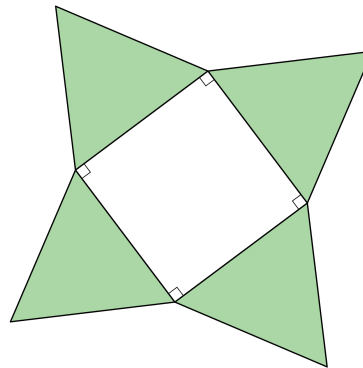
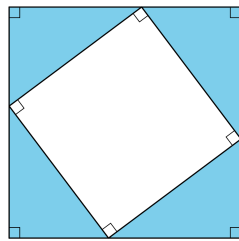
What do you notice? What do you wonder?

From Grade 8 Unit 2 Lesson 13



What do you notice? What do you wonder?

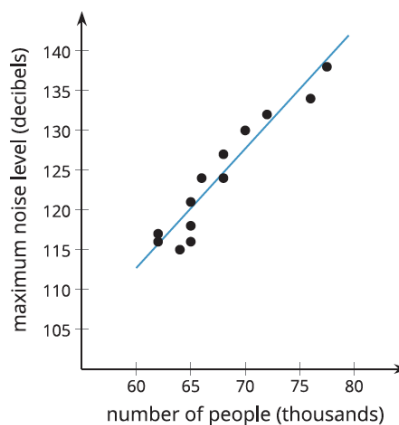
From Grade 8 Unit 8 Lesson 7



What do you notice? What do you wonder?

From Algebra 1 Unit 3 Lesson 4

$$y = 1.5x + 22.7$$



HANDOUT 5

Which One Doesn't Belong Examples

Which One Doesn't Belong? Routine

1. Display the set of images for all to see.
2. Give students x minutes of quiet think time.
3. Ask them to give a signal when they have noticed one that does not belong and can explain why.
4. In small groups, tell each student to share their reasoning why a particular image does not belong. Together, find at least one reason each image doesn't belong.
5. Ask each group to share one reason why a particular image does not belong.
6. Record and display responses for all to see, as close to images as possible.

Which one doesn't belong?

From Grade 6 Unit 8 Lesson 10

$$\frac{8 + 8 + 4 + 4}{4}$$

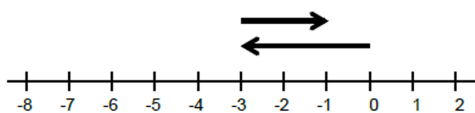
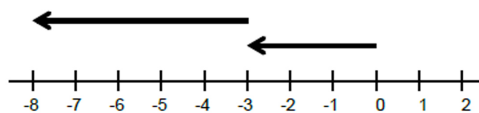
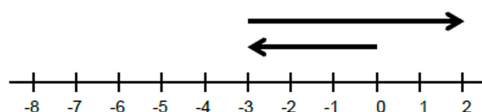
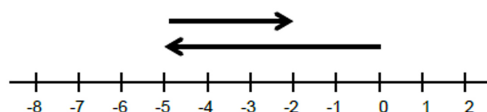
$$\frac{10 + 10 + 4}{4}$$

$$\frac{9 + 9 + 5 + 5}{4}$$

$$\frac{6 + 6 + 6 + 6 + 6}{5}$$

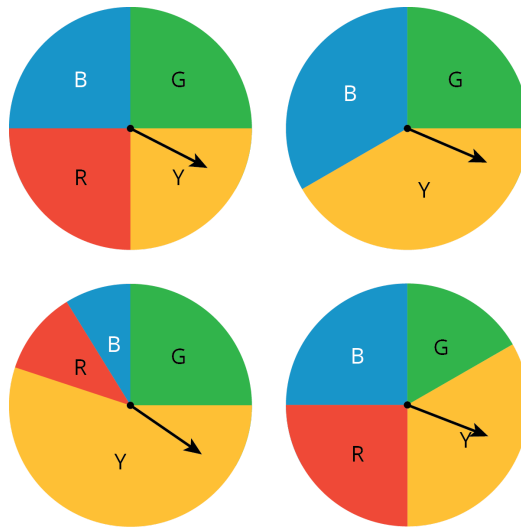
Which one doesn't belong?

Adapted from Grade 7 Unit 5 Lesson 2



Which one doesn't belong?

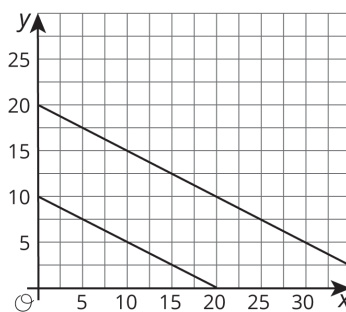
From Grade 7 Unit 8 Lesson 6



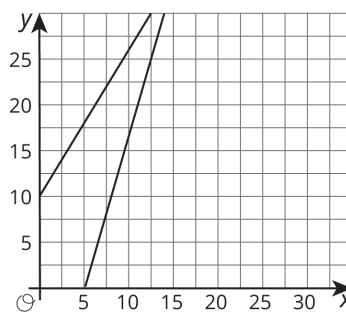
Which one doesn't belong?

From Grade 8 Unit 3 Lesson 11

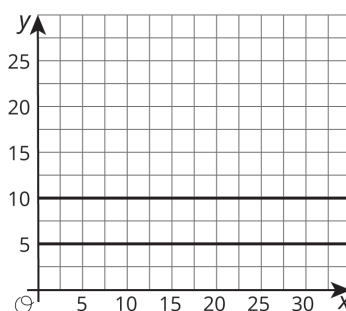
A



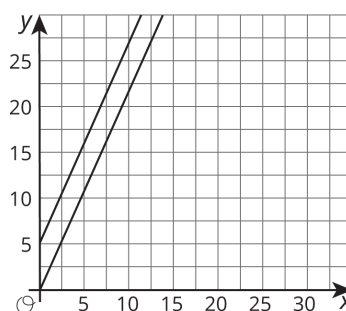
B



C

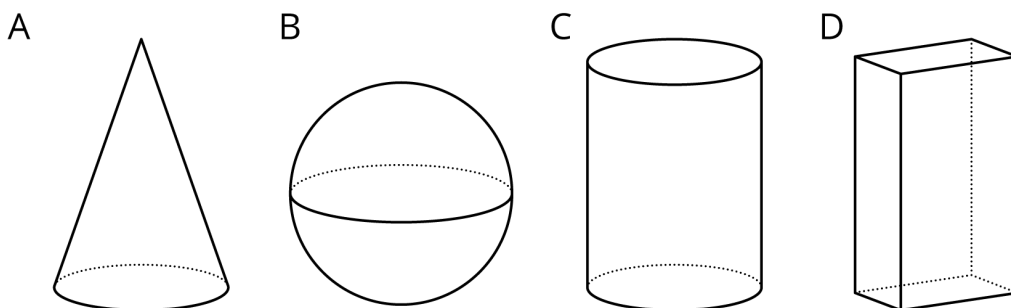


D



Which one doesn't belong?

From Grade 8 Unit 5 Lesson 11



Which one doesn't belong?

From Algebra 1 Unit 5 Lesson 2

Table A

x	y
1	8
2	16
3	24
4	32
8	64

Table B

x	y
0	0
2	16
4	32
6	48
8	64

Table C

x	y
0	1
1	4
2	16
3	64
4	256

Table D

x	y
0	4
1	8
2	12
3	16
4	20

HANDOUT 6

Planning and Reflecting on Routines

Anticipate <i>Do the math for the warm-up. Anticipate student responses.</i>	5 Practices Uncover misconceptions Math vocabulary
How might this routine be an invitation to the mathematics? Gets the students to think about the problem before they need to do any calculations. Incorporates “notice and wonder” into their thinking process. Gives students a “tieback” to the initial problem. When students share their thinking, which ideas, concepts or strategies will be important to highlight or amplify to encourage connections and reflections?	
Rehearse <i>Practice recording and annotating some anticipated responses as you rehearse the routine.</i>	
Vertical lines Horizontal lines Intersect Positive and Negative Slope (no slope) Zero slope Y-intercepts Proportional Constant Rate of Change	
Reflect <i>Try the routine with family, friends, or colleagues. What happened? How did it go? Teachers will not need 30 minutes to complete this warm up. Using a timer will be crucial. Instructional routines launch a lesson,- they are NOT the actual lesson. I found it challenging to type exactly what someone said without paraphrasing.</i>	

Who got to do math? How do you know?

How did the routine invite students to engage in the mathematics?

How might you use or adjust the routine so all students do math in your classroom?

HANDOUT 7

Learning Targets

1. I can describe an instructional routine.
2. I can describe how instructional routines help students
 - a. play with mathematical ideas
 - b. learn by collaborating with each other, and
 - c. listen, respond to, and value each other's thinking.
3. I can prepare an instructional routine.

HANDOUT 8

My Reflections

**Establishing
Instructional
Routines**

I am looking forward to . . .

I am curious to find out . . .

--	--

HANDOUT 9

Are You Ready for More?

Pre-Work for all Sessions

[Link to one document](#) containing all the pre-work.

Pre-Work for Session 2

- Take a tour of your online platform.  [A Tour of KH Online Platform.pdf](#)

Pre-Work for Session 2

Complete a Tour of Kiddom's Online Platform.

[PDF to print or save](#) **OR** [Make a copy for your own Google Drive](#)

- Budget your time for all the pre-work.

Instructional Routine Cards

If you'd like, print these instructional routine cards (two-sided) for quick access to the structure and purpose of each routine while facilitating with students. (Note: Each page can be cut in half to make a second set of cards, so you can share with a colleague.)

- [Instructional Routine Cards](#)

Next Steps

Taking a chance to try, study, and reflect on the routines before you use them for the first time in Unit 1 can be helpful and powerful.

Before our final session together, we recommend:

- [Planning, Rehearsing, and Reflecting on an Instructional Routine](#)

IM blog post recommendations:

- [What Is an Instructional Routine?](#)
- [The Art of Reflection](#)
- Differentiating Instruction with IM 6–12 Math™ (coming soon!)

Once you have clicked on a blog post, subscribe to the blog by entering your email address on the right sidebar. Subscribing will ensure you receive email notifications of future blog posts.

Copyright Information: All curriculum excerpts are under the following licenses.

IM 6–8 Math™ was originally developed by Open Up Resources and authored by Illustrative Mathematics®, and is copyright 2017-2019 by Open Up Resources. It is licensed under the Creative Commons Attribution 4.0 International License ([CC BY 4.0](https://creativecommons.org/licenses/by/4.0/)). OUR's 6–8 Math Curriculum is available at <https://openupresources.org/math-curriculum/>.

Adaptations and updates to IM 6–8 Math are copyright 2019 by Illustrative Mathematics®, and are licensed under the Creative Commons Attribution 4.0 International License ([CC BY 4.0](https://creativecommons.org/licenses/by/4.0/)).

Adaptations to add additional English language learner supports are copyright 2019 by Open Up Resources, and are licensed under the Creative Commons Attribution 4.0 International License ([CC BY 4.0](https://creativecommons.org/licenses/by/4.0/)).

Adaptations and additions to create IM 6–8 Math Accelerated are copyright 2020 by Illustrative Mathematics®, www.illustrativemathematics.org, and are licensed under the Creative Commons Attribution 4.0 International License ([CC BY 4.0](https://creativecommons.org/licenses/by/4.0/)).

All professional learning materials are copyrighted by Illustrative Mathematics®. After purchasing an Illustrative Mathematics® professional service, we grant you a license to edit, add to and share the applicable content with the educators in your school district as long as they are not being used for commercial purposes.

To ensure our materials are used as intended, access to any content provided digitally must be limited to employees of your school district. As you share the materials within your district, you must give attribution to Illustrative Mathematics® and identify any changes you made to the content.