

EDMA 3100 Assignment #2 Resource and Rich Task Exploration and Design

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Part 1

Resource #1: Slow Reveal Graphs <https://slowrevealgraphs.com/>

Description: Graphs make math visual, fun, and meaningful for young learners!

Big Idea: (Grade 1)

“Concrete graphs help us to compare and interpret data and show one-to-one correspondence.”

1. Students are interpreting a quantitative comparison
2. They build meaning of the scale and measurement, which deepens their understanding of what the quantities actually represent.
3. The gradual reveal encourages them to reason about relationships rather than just reading off values.

Curricular Content (Grade 1): *Students are expected to know the following:*

“concrete graphs, using one-to-one correspondence”

- I chose this content because students love to visualize when it comes to math. Having them view a graph with many different colours and content could help get them engaged when they are discussing, using, and making concrete graphs.

Review Commentary: I would use this resource as a possible bell ringer or beginning portion of a lesson because it is a great resource for students to start their math thinking and engage their inquiry. For example, I could use one of the easier graphs for a grade 1 class, like the “Most Popular Pets” graph, to engage in conversation with students and ask them questions before looking at the graph, like “What kind of pets do you all have?”. This resource is also great because it includes slides that the teacher can go through step by step, explaining what each part of the graph represents, which they could do with the class. I also noticed that it gives more in-depth analysis for more complicated graphs that the teacher could use for higher grades. Personally, if I were an elementary-level student, I would be very excited to start a math lesson or bell ringer with something like this.

Resource #2: Which One Doesn't Belong?

<http://www.meaningfulmathmoments.com/which-one-doesnt-belong-wodb.html>

Description: Encourages reasoning, discussion, and multiple ways of thinking!

Big Idea: (Grade 3)

“The likelihood of possible outcomes can be examined, compared, and interpreted.”

1. Focuses attention on groups of numbers and number relationships
2. Engages students in problem-solving
3. Encourages using Mathematical vocabulary and discussion to get other perspectives

Curricular Content (Grade 3): *Students are expected to know the following:*

“pattern rules using words and numbers, based on concrete experiences”

- I chose this content because it relates to the students using patterns, words and numbers to find which object or image doesn't belong. For many of these, there could be different things that could be good for students to discuss and having students communicate their findings is essential for mathematics development.

Review Commentary: Similar to the first resource, this would be a great bell ringer activity for students when they begin the day or begin the math lesson. It allows students to collaborate and discuss different ideas as to what could be different. I have noticed that when I do these in class, I always learn from classmates that maybe I didn't see or think about before. After exploring the resource, I found many different tools I could use in my classroom. Not only does it have activities like what doesn't belong, but many instructional objectives for all grades. My favourite part about this resource is that it has so many mathematical inquiry-related sources, like the pattern sections, where it gives you talking points, assessment tools, and charts that describe real-world things to help students relate to the content, no matter what it is.

Resource #3: Starting From the Beginning

<https://startingwiththebeginning.wordpress.com/daily-math-investigations/>

Description: Comprehensive, ready-to-use math investigation activities for early learners.

Big Idea: (Grade 2)

“Development of computational fluency in addition and subtraction with numbers to 100 requires an understanding of place value.”

1. **“1-100 chart”** — by working with a full 1-100 number chart, students deepen their understanding of tens and ones
2. **“Making 10”** — this activity helps students see how combinations of ones make a ten (and tens plus ones make larger numbers), reinforcing the structure of place value as they build fluency in adding and subtracting
3. **“Race to 50”** — by racing to higher numbers (up to 50), students develop a sense of how tens and ones accumulate, which supports fluent addition/subtraction toward 100.

Curricular Content (Grade 2): *Students are expected to know the following:*

“addition and subtraction to 100”

- I chose this content because this resource is rich full of activities that are useful to incorporate into a grade 2 classroom. This resource gives teachers many options for students to practice addition and subtraction to 100. The variety of games and activities allows students to have different perspectives on how to do addition and subtraction, and if one resource doesn't work, there are plenty to choose from.

Review Commentary: One game that I found in this resource that I think would engage students in different ways would be the "Race to 50". This game builds number sense by having students add and subtract to 50. It also makes math learning active and engaging because it's a hands-on, game-based way to practice computation. As a teacher, you could also change it to a race to 100 or more for students who may be experts in addition or subtraction. You could also have them use more than one die to add or subtract bigger numbers. Another way you could easily change it is for students who may struggle with addition or subtraction; you could do a race to 25 or something similar. Overall, it turns abstract number concepts into a fun, visual, and interactive experience, which is perfect for addition and subtraction skills to 100.

Resource #4: The Fraction Splat! Series

<https://stevewyborney.com/2017/03/the-fraction-splat-series/>

Description: Engaging, visual fraction puzzles that deepen reasoning and math talk.

Big Idea: (Grade 4) "Fractions and decimals are types of numbers that can represent quantities."

1. For beginners, a slide where a shaded portion of a circle is hidden under a "splat," and students must determine what fraction of the whole is hidden
2. There is a version where multiple "splats" cover equal parts of a shape or diagram, and students must figure out how many parts each splat covers and what fraction each represents.
3. A more advanced slide using two-colour splats where students determine different fractional amounts hidden by different colours, thus reinforcing that different fractions can represent different quantities within the same whole.

Curricular Content (Grade 4): *Students are expected to know the following: "ordering and comparing fractions"*

- I chose this content because fractions can be hard for students to visualize on paper. Having students visualize through activities like the fraction splats can help them comprehend how fractions are laid out, and allows teachers and students to have different levels of difficulty with their fraction splats. The resource provides plenty of levels to order and compare fractions.

Review Commentary: This resource is rich with content and is designed with slides that teachers could use for a lesson or even a unit plan. There are 20 ready-made downloadable slides that teachers can use for their lessons, ranging in difficulty. As a teacher, you could scaffold students by doing the single splats together. Once students are ready, they can practice the double splats in groups or with partners. You can use early slides for introduction

and then progress to more complex ones as students' understanding grows. I think incorporating fraction splats into your classroom meets the BC curriculum's big ideas and content for more than just grade 4 and is an excellent way to include all students, whether individually or collaboratively.

Resource #5: Big Ideas Math

https://bim.easyaccessmaterials.com/teachers/game_closet.php

Description: Engaging, ready-to-use math games supporting multiple topics and skill practice.

Big Idea: “Decimals, fractions, and percents are used to represent and describe parts and wholes of numbers.”

1. Let's Go Shopping: Students, with a partner, choose individually items from the given list to add them up using the numerical decimal amounts. Once every item is off the list, the student with the closest number to 30 after all of the price amounts have been added up that student wins. This game helps students improve their addition with a decimal while applying it to real situations
2. Match Them Up: Students collect sets like ($\frac{1}{2}$, 0.5, 50%), matching three representations of the same quantity. This clearly aligns with understanding parts and wholes via different numeric forms.
3. Order Matters: Players organize cards (including fractions, decimals and percents) from smallest to largest or largest to smallest, helping them compare amounts across these different formats and understand which represents a greater or smaller part of a whole.

Curricular Content (From Grade 7): *Students are expected to know the following: “operations with decimals (addition, subtraction, multiplication, division, and order of operations)”*

- I chose this content because operations with decimals can be boring if a teacher gives you questions to just answer straight up. Having a resource like this can turn decimals into real-life situations where students can use decimals, fractions, and whole numbers in their lives and see how they are applicable in math. Overall, this resource turns the big idea into active learning that can help Grade 7 students connect numbers, fractions, decimals, and percents as interrelated ways to describe parts and wholes.

Review Commentary: The game I thought was most impactful for students would be the Let's Go Shopping game. This game can help students use decimals in the same way they would use them in real-life situations. Money is something that we use every day. Having the skills to add, subtract, multiply, and divide money will be a useful tool for students to have as they grow up. Not only does it help with real-life situations, it helps students see decimals in multiple ways and perspectives. As a teacher, you could enhance games like this for students who may be good with decimals by giving them bigger numbers to choose from, as well as

making it easier by making the decimals single-digit instead of multiple. This game could be used in a variety of different ways to enhance students' knowledge of operations with decimals, which can be altered to any skill level.

Part 2

Addition and Subtraction within 100

Candy Shop Problem

Content and Task Decisions

Grade level: Grade 2

Mathematics Goals

Big Idea: Numbers are used to represent quantities and to describe relationships.

Curricular Competency: Apply strategies for addition and subtraction with fluency and understanding.

Content:

- To understand number concepts to 100
- To understand addition and subtraction to 100
- To use real-life events to compare and contrast an understanding of number concepts
- To begin an understanding of financial literacy by role-playing financial transactions

Consider Your Students' Needs

Students will have worked on and recognize, read, and write numbers up to at least 100. Most students should also understand basic addition and subtraction from prior classes and grades. Recording thinking is encouraged; however, it needs to be reminded of when students get stuck. Students may not have worked with forms of money before, so it will be important for them to be given clear instructions on how much each coin is worth. It might be good for the teacher to go over it in a “Readiness Check” before getting into the lesson and activity.

Readiness Check (Before Lesson)

- Before the lesson begins, it may be important to have students understand how the currency will work for the activity, so students have at least the basic knowledge of the topic before expanding their thinking during the lesson.

Ask Students:

- “Who can show me 15 candies with these counters?”
- “If I take away 5, how many are left?”
- “What if I add 3 more?”
- This quick review ensures all students are confidently ready to move into the rich task phase.

For English Language Learners

- Use visual supports (pictures, manipulatives) for students who may not be able to read or write English very well. Using candy instead of written forms as a visual support will help.
- Peer collaboration for language support will also be something to help aid ELLs. Having students collaborate with an ELL can help them see what others are doing and the ways they are communicating within the activity, as well as model the written portions.
- Use multilingual resources by labelling materials in English and home languages, or create a worksheet in Google Classroom that can be easily translated.
- Celebrate multiple ways of showing thinking for students by having them focus on the math reasoning, not perfect language, but ensure they are starting to use English in different forms.

For Students with Difficulties

- **Low Floor:** Students can count candies using manipulatives or pictures.
- **High Ceiling:** Students can create multi-step problems, calculate totals for multiple customers.
- Students who may struggle with quick mental math may be allowed to use a number line to represent their equations. A number line would be something they have been introduced to in prior lessons, so students could use the learning that they had prior to and apply it to this activity. These are great strategies and should be encouraged for students to use.

- Using consistent phrasing and repeated directions slowly to reduce cognitive load for students who may get confused easily.
- If sensory overload has been common with a student, allow them to go at their own pace, allowing breaks.

Extra Support:

- If students struggle with this activity, they can use the resource from the “Start From the Beginning Activity” (Resource 3) to practice their counting, adding, and subtracting to further their understanding.

Materials

Each Student will need:

- Plastic or paper candies/counters
- Whiteboard/markers
- Pencils & Erasers
- Number line for support
- Recording sheets for students
- Candy Shop Worksheets for the activity
- Exit Ticket

Teachers will need:

- Plastic or paper candies/counters
- Whiteboard for instruction
- Recording sheets for students
- Exit tickets (Provided at the end)
- Candy Shop Worksheets for the activity

Lesson

Before/“Readiness Check” Warm-up Before the Lesson

- Go over classroom expectations to establish how the teacher would like students to behave and work. Ask questions like “**What do you do when others are talking?**” and “**How do you think our work time should look and sound like?**”

- **Hook:** Begin by showing the class a jar of candy. Ask students to guess how many candies are in the jar, and whoever guesses closest or correctly gets a candy. (Example: Have 32 Candies, as it might be easier for students to guess at how many are in the jar.)
- Ask the winner to explain their thinking to the class.
- Introduce the “Candy Shop” scenario with props on the table for students to see how the activity will be laid out. **“Today, we are running our own candy shop! Let’s see how many candies we have in the jars”.**
- Take all of the candies out of the guessing game and put 5 candies in.
- By showing the class a jar full of candy to the class, ask the students

“How many candies are in the jar?” (5 Candies)

“If I add more candies, how many will there be?” (Add 3)

- Elicit student predictions on addition/subtraction problems using the candies. (Do this 3/4 times to get students thinking by asking them and reiterating questions to them as a back-and-forth conversation would look like.)

Present the focus task to the class:

- Students work in pairs as shopkeepers and customers for their own candy shop.
- Each pair receives a set number of candies (Counters).
- Each pair receives a set of paper tokens, each valuing 1 token for 1 candy.
- Each Pair receives one worksheet.

Provide clear expectations for the worksheet:

- Using an overhead document camera:
 - Show the students where and how to,
 1. Put both names and the date at the top of the paper.
 2. Take turns being the shopkeeper and the customer.
 - a. Model this with a student to ensure all students understand their role in each of the scenarios
 3. Use candies, counters, or pictures to solve the problems below.
 4. Go over the questions with the students to improve their understanding
 5. Example: “We start with 30 Candies.”
 - “If we buy 5 Candies, how many will there be?”

- “If we sell 3 Candies, how many will there be?”
- “Write your calculation down and check with your partner.”
- 6. **(Optional)** If students get through the activity, have them create their own scenarios with different amounts for addition and subtraction.
- 7. Have students read back instructions to ensure a good understanding.
 - Place students in pairs to work collaboratively and possibly strategically for some students to model thinking for ELLs or students with disabilities.

During

Initially:

- Question students to be sure they understand the task and the meaning of adding and subtracting. Look for pairs who may be struggling to begin their worksheet. Do not give away answers, but ask them open-ended questions like “If we have this amount and add this amount, how many would we have?”.
- Encourage the use of counting on fingers as well as number lines, which they have used in past lessons.

Ongoing:

- Observe and ask the assessment questions, posing one or two to a student and moving to another student (see the “Assessment” section of this lesson).

After:

Bring the class together to share and discuss the task:

- Ask each pair to share one problem they solved.
- Discuss different strategies used: counting, using number lines, and mental math.
- Connect the activity back to the big idea:
 - **“See how numbers help us describe what is happening in our candy shop?”**
- **Discuss patterns:**
 - **“Which strategies were easiest?”**
 - **“Which were tricky?”**
- Provide each student with an exit ticket.

Students individually solve **one addition and one subtraction problem** related to candies on an exit ticket:

1. “You have 14 candies. A customer buys 7. How many are left?”

2. “You add 5 candies to your jar. How many do you have now?”

- Collect and quickly check for understanding before the next lesson.

Assessment

Observe

- Are students correctly using addition and subtraction strategies?
- Are students engaged in problem-solving and collaboration?
- Do students show the ability to represent problems with numbers and pictures?

Did students understand the Lesson?

- Exit ticket (“You have 14 candies. A customer buys 7. How many are left?”, “You add 5 candies to your jar. How many do you have now?”).

Ask

- How did you know how many candies were left?
- Can you think of another way to solve this problem?
- What would happen if we had more customers buying candies?
- What strategies did we use to solve the question? Why?

