

Scavenger Hunt

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The Arts in STEM: Advancing Meaningful Integration

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Original Lesson Plan

Objective(s):

- **SWBAT use proportions to solve for missing dimensions in similar shapes.**
- **SWBAT differentiate between congruent and similar figures and use scale factors to determine how many times bigger or smaller a new image is compared to a similar original image.**

Stages of Lesson

- 5.2 HW Check
- 5.2 IXL Entrance Ticket
- 5.3 Opening Activity
- 5.3 Notes
- 5.3 IXL Exit Ticket

Details

5.2 HW Check:

- Students will go over 5.2 HW. I will project the problems on the board, and we will briefly explain the steps for certain problems. Students should raise their hand whenever they have a question.

5.2 IXL Entrance Ticket:

- We will spend five minutes on the 5.2 IXL Entrance Ticket to assess their mastery on setting-up and solving proportions. We will use this data to help us plan for our review day next week.

5.3 Opening Activity:

- Next, we will transition to the Opening Problem
- Have students work in groups of two but still create their own math models.
- Go over the definition of ratio, proportion, and have a discussion on what makes a proportional relationship.
- Display Part 1 of the Opening Activity on the projector. Show the two images of the cheque. The top cheque is the original cheque and the bottom cheque is the new printed version. First, informally ask students what they notice and/or wonder about the two checks.
- Elicit responses and have students conclude that the dimensions of the two cheques are in a proportional relationship with each other. Have students solve for the unknown dimension on the printed version of the check.
- Students and their partners will claim a spot on one of the three large whiteboards and solve for that unknown dimension. Since they are in a proportional relationship, students should be aware that they should be setting up a proportion to solve for the unknown dimension. If a student is not and they are way off in their approach, guide them towards setting up a proportion through questioning.
- Once the groups of two have completed their models, have students go back to their seats.

- Pick a few proportions and make the point that proportions can be written in multiple ways. Students could have either set up the ratios in that proportion by Corresponding Side Lengths or by Same Figure.
- And then recall prior knowledge of solving proportions by re-emphasizing the “Butterfly Method” for cross multiplication and then solving the equations.
- Once Part One is done, go to Part Two of the activity and pose the Main Question: “How many times bigger are the dimensions for the printed cheque vs. the dimensions for the original?”
- Give students a moment to think about the question before going back to their whiteboard location and answer.
- Some of the students will already know what to do, while other students will need guidance.
- Some students may even use subtraction between the corresponding side lengths instead of multiplication/division. Emphasize that there is a difference between “how much bigger” and “how many times bigger”.
- Once students have their answer, bring them back to their desks.
- Introduce the concept of Scale Factors.

5.3 Notes

- Transition to 5.3 Notes and pass out the packets
- Whole group instruction on first two pages where we go over the difference between Congruent Figures and Similar Figures and go through a couple example problems.
- Separate the students into four groups of two and group of six.
- Have students complete #'s 1-13 ODDS in their groups. All work must be shown.
- Go over when you have an Enlargement or a Reduction and discuss the type of Scale Factor for each.

5.3 IXL Exit Ticket

- Assess student mastery with two Exit Ticket questions.

Differentiation

- Students working on Opening Activity Part I & II with their partner
- Students working on 5.3 Notes in different groups of two and one large group of six with the support teacher. These groups are determined by ability-level.
- Groups working at different paces
- Individual or Small-Group instruction wherever necessary.

Assessment

Informal: 5.2 IXL Entrance Ticket

Formative: 5.3 IXL Exit Ticket

Modifications for Lesson Plan

After reflecting on this lesson and reviewing the Formative Assessment results, I would say that the lesson was successful overall. However, I would definitely modify the lesson by including an opportunity for students to use Digital Art Making to create similar figures. My Opening Activity was an effective way to review proportional relationships and introduce scale factors. However, it may have been more effective if I had students create their own similar figures using a Digital Art Making tool. At the very beginning, I could have given students a series of Original vs. New Image examples and had them categorize them either as Congruent Figures or Similar Figures in groups of two. Students should then be able to conclude on their own that the corresponding side lengths of similar figures are in a proportional relationship. At that point, my original two part activity could have had the same exact questions, except this is where students could have created their own similar figures instead of having to solve the one I gave them. My students may need a class to experiment with the Digital Art Making tool on their chromebooks before being able to complete this Opening Activity on Scale Factors.