Name: Mary Johnson  
Lesson Topic: Scale Drawings and Models in Singapore and Malaysia  
Number of Days: 8-10

Learning Goals/Target for this Lesson:

Standards addressed in this Lesson:

Mathematical Content Standards:

- Draw, construct, and describe geometrical figures and describe the relationships between them.  
  CCSS.MATH.CONTENT.7.G.A.1 Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.

- Analyze proportional relationships and use them to solve real-world and mathematical problems.  
  CCSS.MATH.CONTENT.7.RP.A.2 Recognize and represent proportional relationships between quantities.  
  CCSS.MATH.CONTENT.7.RP.A.3 Use proportional relationships to solve multistep ratio and percent problems.

Mathematical Practices Standards:

- CCSS.MATH.PRACTICE.MP4 Model with mathematics.  
- CCSS.MATH.PRACTICE.MP5 Use appropriate tools strategically.  
- CCSS.MATH.PRACTICE.MP6 Attend to precision.

Students Will know:

- Ratios and scale factors are used to create scale drawings and scale models that are similar to real life geometric figures.

- How and why scale models and drawings are used in the real world.

Students Will Be Able To:

- Solve problems involving scale drawings and models of geometric figures.

- Compute measurements from scale drawings and models using strategies such as proportions.

- Make a scale model using 3D printing technology.

Lesson Essential Question:

How can I use scale drawings, maps and scale models to help understand the world around me?

Activating Strategy:

Students watch a slideshow about Singapore and Malaysia from Ms. Johnson’s trip. As an alternative, the following Youtube videos could be used:

- Singapore Travel Guide  [https://www.youtube.com/watch?v=P_q3BdrFsLl](https://www.youtube.com/watch?v=P_q3BdrFsLl)
- Malaysia Travel Guide  [https://www.youtube.com/watch?v=mtIeLsMbfzg](https://www.youtube.com/watch?v=mtIeLsMbfzg)
- Kuala Lumpur Travel Guide  [https://www.youtube.com/watch?v=0MfneG2aWPg](https://www.youtube.com/watch?v=0MfneG2aWPg)

Key vocabulary to preview and vocabulary strategy:

- scale, scale factor, ratio, proportion, scale drawing, scale model, dimensions
# CHCCS Learning-Focused Lesson Plan

**Lesson Instruction**

### Learning activity 1: (1-2 days)
- Teacher demonstrates example map scale problems using MAP D (Peninsular Malaysia) finding the scale factor of the map and finding the actual distance between Kuala Lumpur and Malaysia.

  Students work in pairs to complete “How big is Singapore?” Task
  Teacher should print out color copies of the maps for each group

**Assessment Prompt for LA 1:**
Think, pair, share “What is a scale factor?”

### Learning activity 2: (2 days)
- Intro to activity: Students view slideshow of Ms. Johnson’s Scale Model Photographs from her trip to Singapore and Malaysia

  As an alternative, students can access the information on these websites.
  Singapore City Gallery: https://www.ura.gov.sg/uol/citygallery?p1=About&p2=architectural-models (The scale of the Island Model is 1:5000)
  Kuala Lumpur City Gallery: https://www.youtube.com/watch?v=EQkY5hYHibY, http://www.klcitygallery.com/index.html (Scale is 1:1500)

  Students work in pairs or small groups to complete City Gallery Task (Could set this up as a stations activity)
  Students work as a whole class to discuss and fill in the graphic organizer.

**Assessment Prompt for LA 2:**
3-2-1 Exit Ticket
List 3 things you know about scale drawings and models
Tell 2 ways that a scale factor can affect the size of a geometric figure.
Write 1 question you have about scale drawings or models.

### Learning activity 3: (4-5 days)
- Students work on final Performance Assessment

  **Materials Needed:** Computers, Access to tinkercad.com, rulers, yardsticks, or tape measures, 3D printers

  Possible additional practice resources:

**Graphic Organizer:**
Scale Frayer Model

**Performance Assessment:**
3D Printing Model Project - Students will work in groups to create a model of one room in the school.

**Student choice options:**
Let students choose an alternative object, room, or building to model

**Extension:**
Students make an enlargement of a small object of their choosing.

**Scaffolding Tips:**
Teacher chooses subject of scale model and can make suggestions for measurement units and scale factor.

**Other Info:** Students will need to set up accounts with Tinkercad.com, which requires a parent email. Students could also use a teacher set up account, so that all projects are stored in the same account.

A 3D printer is not required for this project, as Tinkercad allows for online ordering of 3D printed projects, or could be done simply as a design project.

**Summarizing Strategy:**
Quick Write Exit Ticket:
1) A model of the Petronas Twin Towers in Kuala Lumpur has a scale of 1:800. What does this scale factor mean?
2) A different model of the Petronas Twin Towers has a scale of 1:1000. Which of these two scale models will be larger? Explain how you know.

Sources:


