

# Scaling It Up!

**Developed by:** Jennifer Reiter, 2014 Iditarod Teacher on the Trail

**Discipline / Subject:** Math, Art

**Topic:** Measurement, Scale

**Grade Level:** 3+

## **Resources / References / Materials Teacher Needs:**

Cut Down to Size at High Noon, A Math Adventure by Scott Sundby

Video: How to Enlarge a Drawing Using a Grid –

[http://www.ehow.com/video\\_5238667\\_enlarge-drawing-using-grid.html](http://www.ehow.com/video_5238667_enlarge-drawing-using-grid.html)

Go Out and Get Creative – Jon Van Zyle explains his painting process –

<https://www.youtube.com/watch?v=kjWKPXn2tnQ>

Copy of Jon Van Zyle’s print “Nod to the Past” - <http://www.jonvanzyle.com/IditarodPrints.html>

## **Lesson Summary:**

Students will work as a team to enlarge a piece of artwork to six times its original size.

## **Standard’s Addressed: (Local, State, or National)**

### **Grade Two:**

CCSS.MATH.CONTENT.2.MD.A.1

Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes.

### **Grade 5:**

CCSS.MATH.CONTENT.5.MD.A.1

Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems.

### **Grade 7:**

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.

<p><b>Learning Objectives:</b></p> <ul style="list-style-type: none"> <li>• TLW measure accurately to determine the actual size of the artwork</li> <li>• TLW multiply by six to determine the size of the reproduction</li> </ul>	<p><b>Assessment:</b></p> <p>The students can be assessed on the accuracy of their measurements and conversions. Once the artwork is complete, it's pretty easy to see where the errors are!</p>
<p><b>Procedural Activities:</b></p> <p>Introduction to enlarging using grids:</p> <ul style="list-style-type: none"> <li>• Share the picture book <u>Cut Down to Size at High Noon</u> with the students.</li> <li>• Display for students a copy of the art print that they will be enlarging. Explain that the challenge is to enlarge the art work to six times the current size.</li> <li>• Have the students identify the method that was used in the picture book that would help with this challenge – using a grid.</li> <li>• There is a demonstration of this technique here: <a href="http://www.ehow.com/video_5238667_enlarge-drawing-using-grid.html">http://www.ehow.com/video_5238667_enlarge-drawing-using-grid.html</a></li> </ul> <p>Introduction to the artwork:</p> <ul style="list-style-type: none"> <li>• Introduce Jon Van Zyle as the official Iditarod artist. Explain that he creates a unique poster and print each year. There is a good interview with him here: <a href="https://www.youtube.com/watch?v=kjWKPXn2tnQ">https://www.youtube.com/watch?v=kjWKPXn2tnQ</a></li> <li>• Discuss the artwork with the students. Discuss how the title helps tell the story of the print. Look at the Iditarod references in the print. What can we infer about the man in the print? My kids were fascinated that there was a cat in the scene and created lots of stories about why he was there.</li> </ul> <p>Challenge 1: Preparing to enlarge</p> <ul style="list-style-type: none"> <li>• Tell the students that we will be working as a full class team to accomplish this task. The three things they need to know for now are: Everyone needs a square, squares have to be the same size and shape, and how many kids will be working on the project.</li> <li>• Provide students (or groups of students) with b&amp;w photo copies of the art print and challenge them to brainstorm ways to divide the artwork into squares in order to meet the three criteria above.</li> </ul> <p>Challenge 2: Enlarging the art</p> <ul style="list-style-type: none"> <li>• As a class (or teacher directed) decide on a set of squares that will be used to divide the original artwork so that each student can have one square to enlarge. We settled on grid that is five squares wide by six squares tall. We didn't allow students to choose squares that were "empty" on the first choice; instead we gave those to early finishers as a second square.</li> <li>• Model with the students how to measure something on the original art, multiply it by six and then draw it on their enlargement square. This is a big difference between the MATH project and the video show above. They MUST measure everything!</li> <li>• Each student creates his enlarged square, colors it, and then compiles it with his classmates squares to create the finished project.</li> </ul> <p>Things to think about:</p> <ul style="list-style-type: none"> <li>• Centimeters work better than inches. Small rulers (six inches) work better than full length rulers.</li> <li>• It's important to discuss what to do if something on the original art measures a fraction of a centimeter.</li> <li>• We encourage the kids to meet with the squares on the sides of them to compare the measurements and see if they match up. They have had some amazing discussions investigating their measurements.</li> <li>• We encourage the kids to meet with the squares around them to discuss color choices. This will (hopefully) create more consistency in color.</li> </ul>	

**Materials Students Need:**

- Copy of Jon Van Zyle's print "Nod to the Past" - <http://www.jonvanzyle.com/IditarodPrints.html>
  - One without grid lines and one with
- Square of drawing papers – you will need to make this square six times as large as the squares in the grid on the original copy
- Crayons, markers, or colored pencils
- Ruler

**Technology Utilized to Enhance Learning:****Other Information:****Modifications for Special Learners/ Enrichment Opportunities:**

- Early finishers can complete a second square to finish out the print.
- This assignment can be simplified by choosing a less detailed piece of art. Maybe they could enlarge the Iditarod shield or logo. Maybe a logo from an Iditarod racing kennel could be used as well.

**Additional Information**