Ch. 18 Proportional Reasoning – Tosha cook

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| **Representative TN State Curriculum Standards**   * **GLE 0606.2.3** Understand and use ratios, rates and percents. * **SPI 0606.2.6** Solve problems involving ratios, rates and percents.   + **0606.2.5** Recognize a:b, a/b, and “a to b” as notations for ratios.   + **0606.2.6** Recognize common percentages as ratios based on fractions whose denominators are 2, 3, 4, 5, or 10. * **GLE 0706.2.3** Develop an understanding of and apply proportionality. * **GLE 0706.2.4** Use ratios, rates and percents to solve single- and multi-step problems in various contexts. * **SPI 0706.2.7** Use ratios and proportions to solve problems. * **0706.2.7** Write number sentences to solve contextual problems involving ratio and percent. | |
| Macintosh HD:Users:oshtosh3385:Desktop:Gulliver's+Travels.jpg | Time: 33 minutes  Jonathan Swift’s novel, *Gulliver’s Travels,* is a story ofLemuel Gulliver’s adventurous mishaps during several voyages around the world. In his first voyage, Gulliver finds a land called Lilliput that is disproportionately smaller than him and all he knows. His second voyage is, to Brobdingnag, where he finds a land that is the opposite of Lilliput in which it is disproportionately larger. The integration of mathematics and this novel will focus on proportional reasoning.   * Students will use a combination of the Cyber Chase Squad scenario videos and the Scale Up, Scale Down activities to develop a sense of proportional reason.   <http://www.teachersdomain.org/resource/vtl07.math.number.rat.lpscaledwn/> |

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| ***Grade 6 Mathematics – Ratio* Time:** 5 -7 minutes  <http://www.learnalberta.ca/content/mesg/html/math6web/index.html?page=lessons&lesson=m6lessonshell03.swf>  A great way to introduce and/or review ratios to students. This manipulative eases the learner into what ratios are and how they work. Then, allows participants to test their ratio skills with an interactive punch recipe and a answering ratio questions by using a chart. |
| ***Thinking Blocks* – *Solving Ratio Word Problems* Time:** 5 minutes  <http://www.thinkingblocks.com/ThinkingBlocks_Ratios/TB_Ratio_Main.html>  This manipulative allows learners to solve ratio word problems, step-by-step, using thinking blocks on six different levels. Learners will read the word problem provided, build a model of the ratio given in the problem by clicking and dragging thinking blocks to the targets, check their answer, and continue with additional steps to answer the word problem. There is also a section to provide feedback and guide learning. |
| ***Math Interactives – Exploring Rate, Ratio, and Proportion* Time:** 2 minutes  <http://www.learnalberta.ca/content/mejhm/index.html?ID1=AB.MATH.JR.NUMB&ID2=AB.MATH.JR.NUMB.RATE&lesson=html/video_interactives/rateRatioProportions/rateRatioProportionsInteractive.html>  Participants are asked to scale the original ratio as close to the target ratio by using the radio buttons. The radio buttons are used to determine how many times larger the target ratio is. Then the manipulative will ask you to drag and drop the correct symbol to indicate if the ratios are equal or not equal. *Math Interactives* will then provide feedback explaining why the chosen answer is correct or incorrect. |

### The Lesson Plan

### Part I: Learning Activity

1. Read the following to set up the activity: "The Cyber Squad is trapped in Proporciona, where all the places and the people are 10 times larger than the kids. They need to warn Mother Board of yet another plot by Hacker, and to do so, they have to sail to an island. They measure a Proporcionan boat using blades of grass. The measurements are shown in Handout 1." (Time: 30 seconds – 1 minute)
2. Ask the students to answer questions 1 and 2 from [Handout: Scale Down and Scale Up](http://www.teachersdomain.org/asset/vtl07_doc_h1scaledwn/)  before they watch the first video segment. (Time: 4 minutes)
3. Tell the students that they will watch a video clip in which the Cyber Squad solves the problem of building a boat that will fit them. (Time: 27 seconds)
4. Show the [In a Land of Giants](http://www.teachersdomain.org/resource/vtl07.math.number.rat.landgiants/) QuickTime VR Video. (Time: 3 minutes and 33 seconds)
5. Ask the students to discuss their answers to handout questions 1 and 2, especially their estimates of the size of a blade of grass. (Time: 5 minutes)
6. Tell the students that they will now watch another video clip, and set it up with the following: "The Cyber Squad travels to the island in their boat, in search of a portal to warn Mother Board of the latest devious Hacker plot. On the island, however, the kids are the giants, 10 times larger than the islanders. One islander, Hank, and Digit's toy Cyber bird, Widget, team up to get to the portal in a cave across a river. Widget is twice as big as Hank. The kids build another boat 2x as big as Hank's boat for Widget to use to warn Mother Board." (Time: 2 minutes)
7. Ask the students to complete part 2 (question 3) of the handout before watching the second video segment. (Time: 1 minute and 42 seconds)
8. Show [Island of the Little](http://www.teachersdomain.org/resource/vtl07.math.number.rat.islandlitt/) QuickTime Video. (Time: 48 seconds)
9. Ask the students to complete Part 3 of the handout, and then review their answers. (Time: 7 minutes)

### Part II: Assessment

[Assessment: Level A](http://www.teachersdomain.org/asset/vtl07_doc_lascaledwn/) (proficiency): Students are asked to figure out the circumference of a Giant's head and of Hank's head, based on the scale of the Giants' sizes to that of the Cyber Squad, and the scale of the Little People's sizes to that of the Cyber Squad. (Time: 7 minutes)

[Assessment: Level B](http://www.teachersdomain.org/asset/vtl07_doc_lbscaledwn/) (above proficiency): Students are presented with two stick figures, and height of one of the stick figures is given with two different scales (paper clips and buttons). Students are given the height of the other stick figure in one scale, and asked to figure out its height in the other scale. This is a classic proportional reasoning task. (Time: n/a because this part will be omitted)

\*\*\*One minute will be used for reflection of the lesson.\*\*\*