

Grade 4 Clarifying Lessons: Am I Related to Myself?

OLD Resources. These resources have NOT yet been updated to align with the revised elementary mathematics TEKS. These revised TEKS were adopted by the Texas State Board of Education in 2005, with full implementation scheduled for 2006–07. These resources align with the original TEKS that were adopted in 1998 and should be used as a starting point only.

What is a Clarifying Lesson?

A model lesson teachers can implement in their classroom. Clarifying Lessons combine multiple TEKS statements and may use several Clarifying Activities in one lesson. Clarifying Lessons help to answer the question "What does a complete lesson look like that addresses a set of related TEKS statements, and how can these TEKS statements be connected to other parts of the TEKS?"

TEKS Addressed in This Lesson

Number, operation, and quantitative reasoning: 4.2B

Patterns, relationships, and algebraic thinking: 4.7

Measurement: 4.12

Underlying processes and mathematical tools: 4.14A, D; 4.15A; 4.16A, B

Materials

- string
- rulers or measuring tapes (metric and customary)
- calculators

Lesson Overview

Students use ratios to discover some nearly constant relationships between measurements of parts of the human body.

Mathematics Overview

Students find and record pairs of measurements, determine the relationship between the pairs of measurements, and use fractions to describe the relationships between the measurements.

Set-up (to set the stage and motivate the students to participate)

1. Have each student use a measuring tape or string and a ruler to measure the distance around his or her head. Have each student also measure his or her own height. The group should then organize these two groups of information in a table to present to the rest of the class, along with two or three summarizing statements about the information in the table. (4.12; 4.7; 4.14A, D; 4.15A; 4.16A)
2. With the whole class, make a table comparing head measurements to height measurements. From the information in the whole-class table, and after discussion of the summarizing statements made by the groups about the possible relationships illustrated in the table, students should try to predict an estimate of the distance around the teacher's head, given his or her height. Measure to check the prediction. (4.12; 4.7; 4.14A, D; 4.15A; 4.16A)
3. Have students work in their small groups to investigate other possible relationships between different body measurements (e.g., around head to around wrist, length of foot to length of forearm). Each relationship should be supported with a table of ordered pairs and summary statements. (4.12; 4.7; 4.14A, D; 4.15A; 4.16A)

Teacher Notes (to personalize the lesson for your classroom)**Guiding Questions (to engage students in mathematical thinking during the lesson)**

- What do the numbers in your ordered pairs represent? (4.7, 4.12, 4.14A)
- How does the table of ordered pairs help you look for a relationship? (4.7, 4.16A)
- How can you use fractions to describe the relationship? (4.2B)
- Are you able to find an "exact" relationship between the members of the ordered pairs, or is it more of an "approximate" relationship? Why do you think this is so? (4.15A, 4.16A)
- How many ordered pairs do you feel like you need to find before you can begin to look for a relationship? (4.16A)

Teacher Notes (to personalize the lesson for your classroom)

Summary Questions (to direct students' attention to the key mathematics in the lesson)

To determine students' understanding of the use of data organized in ordered pairs to identify a relationship, ask questions such as:

- What are the benefits of organizing the information in ordered pairs within a table? (4.7)
- What relationships did you find? (For example, "The length around my head is $\frac{1}{3}$ of my height.") (4.7, 4.16A)
- What effect does the "approximate" nature of measurement have on your data and on the statements you make about the relationships you observe? (4.12, 4.15A, 4.16A)
- What sets of data did you gather that did not seem to have a particular relationship? Why do you think there is not a relationship? (4.15A; 4.16A, B)
- Can you write an equation to describe the relationship in a summary statement made by you, or your group, or another group? (4.15A)
- Are there any other factors we might need to consider along with the statements of our relationships? For example, are these relationships true for humans of every age? (4.14A; 4.16A, B)

Teacher Notes (to personalize the lesson for your classroom)**Assessment Task(s) (to identify the mathematics students have learned in the lesson)**

- Have students use appropriate mathematical language and symbols such as fractions to record in their mathematics journals the relationships they found.
- Give students a set of ordered pairs of measurements in a table and have them use appropriate mathematical language and symbols such as fractions to describe the relationship represented by the ordered pairs.

Teacher Notes (to personalize the lesson for your classroom)

Extension(s) (to lead students to connect the mathematics learned to other situations, both within and outside the classroom)

- Students can write an equation to describe the relationship they found in their table of ordered pairs.
- Students can generate some stories about how knowing these relationships might be useful.
- Students can graph the ordered pairs in their table on a coordinate grid to see what the relationship looks like.
- Students can make collections of other sets of related information (e.g. grams of fat compared to calories of fat, length of phone call compared to cost of phone call) from magazines, newspapers, and world almanacs.

Teacher Notes (to personalize the lesson for your classroom)