Our Soccer Math Problem

To begin our math problem, visualize a soccer game, or watch a You Tube clip of a scrimmage for a few minutes. We can engage our students in an interesting context. Here is a link to a clip: http://www.youtube.com/watch?v=sMCajMJDtaw

Introduce and read the soccer math problem together.

You were analyzing some data taken from their game to add one player to your combined girls / boys team.

Look at the data collected from the scrimmage and decide who you would choose to join your team.

Player	Total number of shots	Goals Scored	fraction	decimal	percentage
Breanne	5	2			
Mark	20	5			
Robert	10	3			
Kerri	7	3			

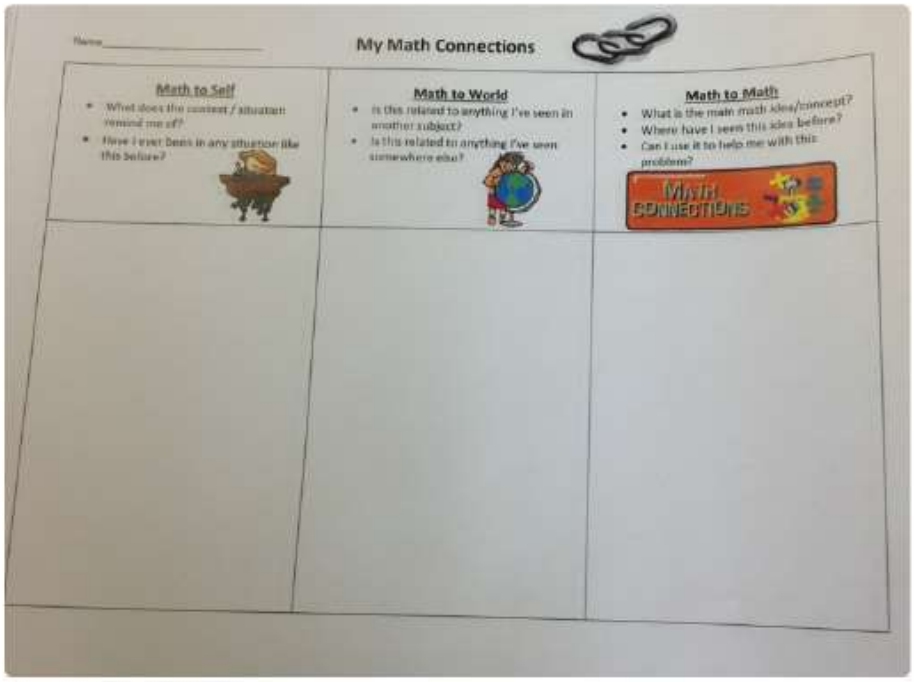
Making Connections

Introduce or review about making connections. If students have made connections in language class, it is great to weave that work to their math connections- after all, it is all about thinking and not content areas!

When we make connections, we are reminded of other images, ideas, things that helps us understand more deeply. We use prior knowledge to construct meaning. We can make math to self, math to world and math to math connections. (See Hyde, 2006 *ComprehendingMath*- for more info on math connections and Gear (2006) *Reading Powers*- for more info on literacy connections.)

Once students have re-read the math problem, have them complete the following math connections blackline master. Usually students start with math to self and math to world connections. These two types of connections tend to make the problem interesting and perhaps engaging for students, but tend to be NOT IMPORTANT to solving the math problem.

Blackline master of Math Connections



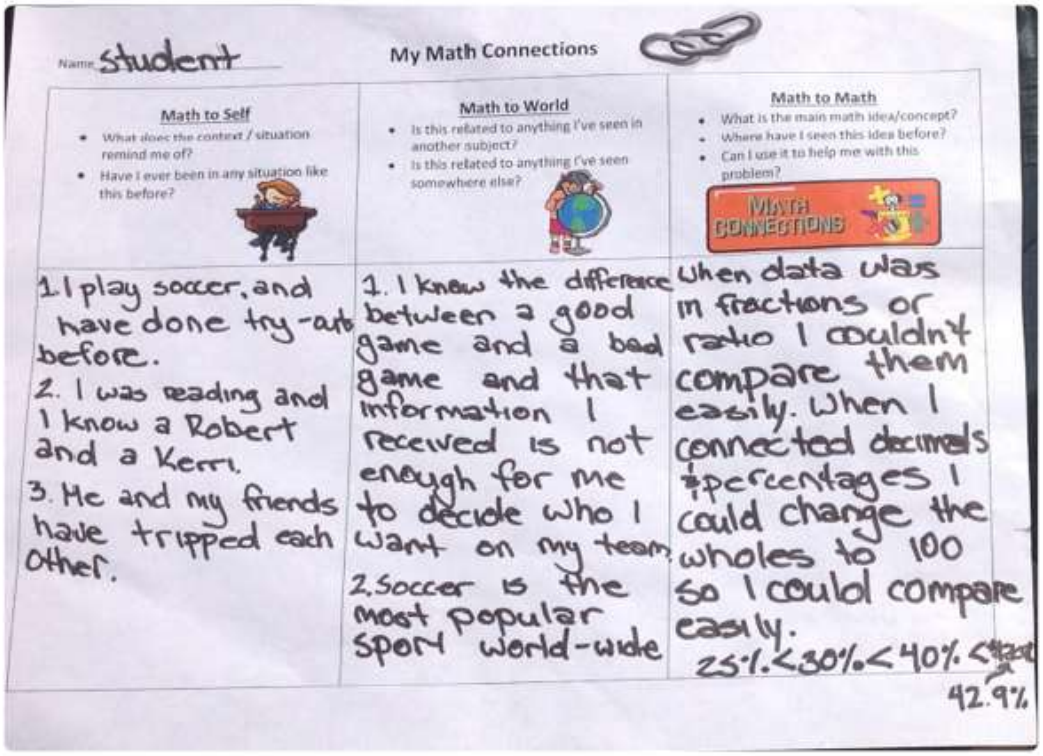
Name _____

My Math Connections

Math to Self	Math to World	Math to Math
• What does the context / situation remind me of? • Have I ever been in any situation like this before?	• Is this related to anything I've seen in another subject? • Is this related to anything I've seen somewhere else?	• What is the main math idea/concept? • Where have I seen this idea before? • Can I use it to help me with this problem?

Cadebar@sd71.bc.ca adapted from Gear (2006)

Student sample



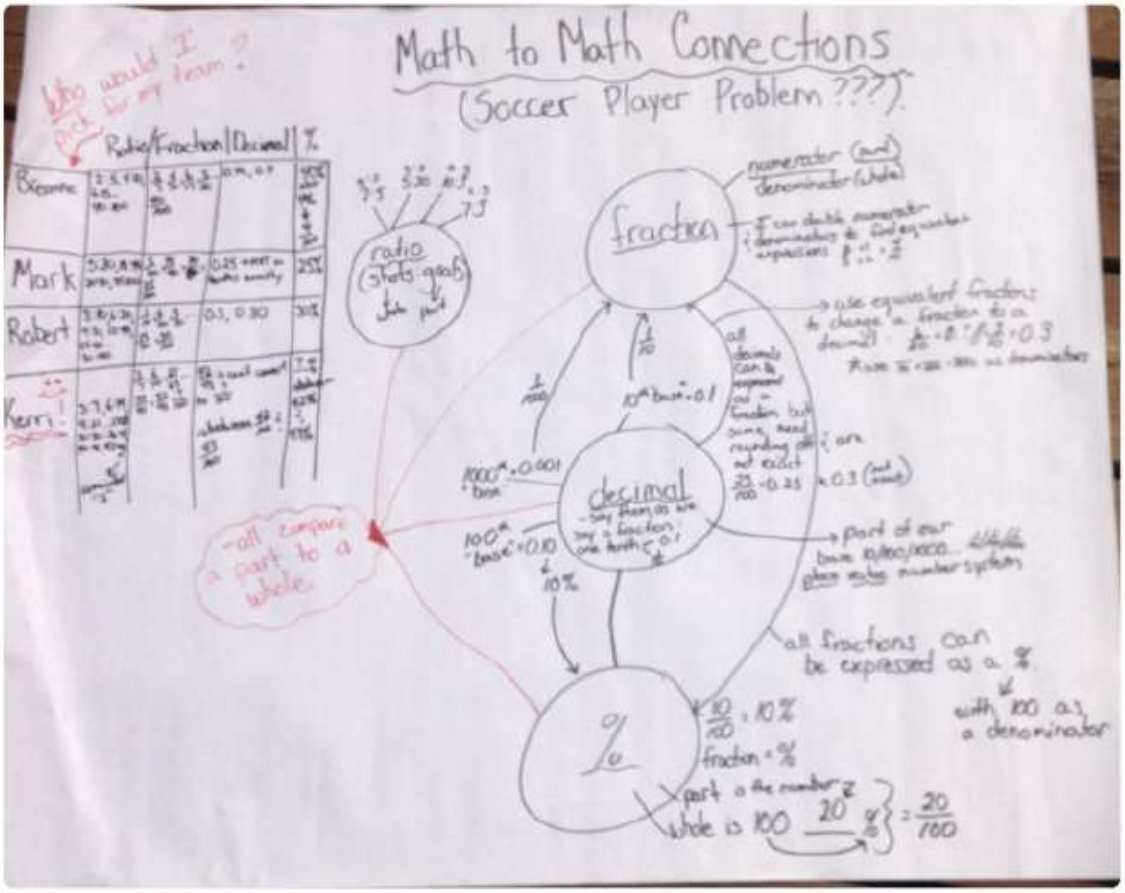
Name Student

My Math Connections

Math to Self	Math to World	Math to Math
• What does the context / situation remind me of? • Have I ever been in any situation like this before?	• Is this related to anything I've seen in another subject? • Is this related to anything I've seen somewhere else?	• What is the main math idea/concept? • Where have I seen this idea before? • Can I use it to help me with this problem?
1. I play soccer, and have done try-ats before. 2. I was reading and I know a Robert and a Kerri. 3. He and my friends have tripped each other.	1. I knew the difference between a good game and a bad game and that information I received is not enough for me to decide who I want on my team. 2. Soccer is the most popular sport world-wide	When data was in fractions or ratio I couldn't compare them easily. When I connected decimals %percentages I could change the wholes to 100 so I could compare easily. 25%<30%<40%<42.9%

Student examples of her connections to the soccer math problem

To model, or guide thinking, a whole-class copy of the same sheet, or a connections web can be created as a poster. The poster was gradually added to and focused on only math to math connections.



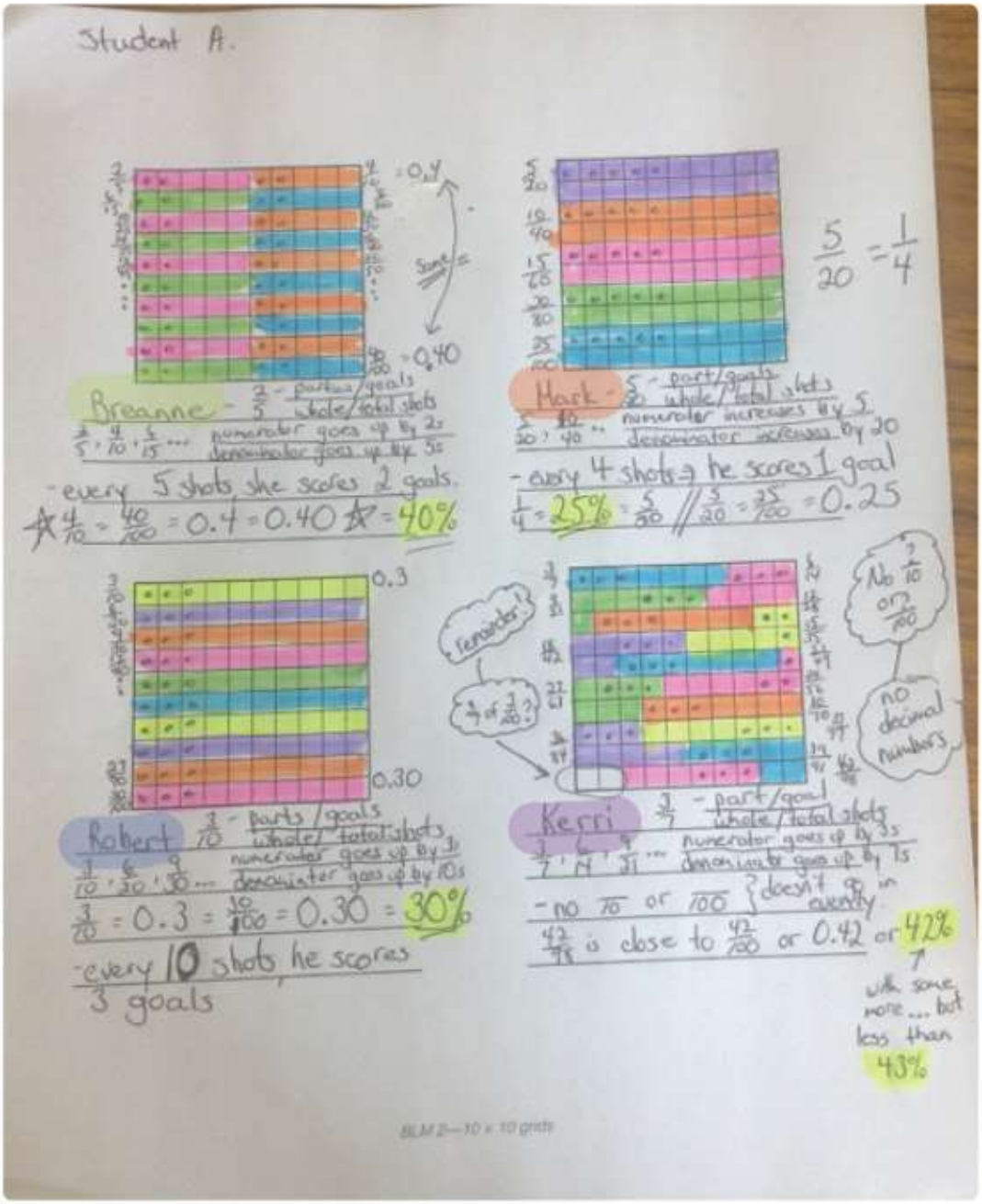
Web of class's soccer problem math to math connections

Have students share their connections as a whole class, in small groups, or with partners. We can notice interesting connections and be asking ourselves the question, "Will this connection help me understand or solve the math problem?

<u>The MATH TO MATH Connections</u> are where we focus our instruction.
"Conceptual understanding is not like an on-off light switch: you don't *understand* a concept in an all-or-nothing fashion. Initially we grasp some aspect of the concept and build upon it, adding and elaborating our understanding." (Hyde, 2006, p. 41)
Students write their own math to math connections and we grow these through our math discussions, teacher instruction and group / individual practice.

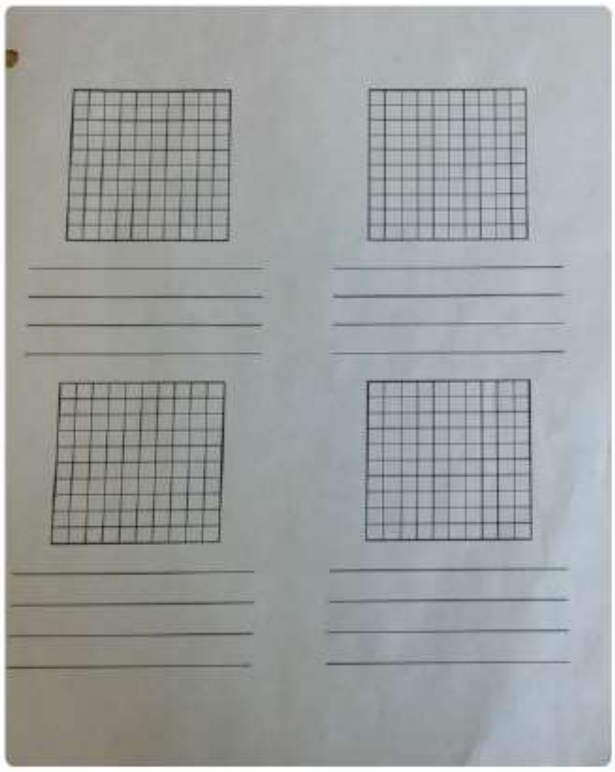
Once students have made math to math connections and begun to link their prior math knowledge with new knowledge, they can begin to problem solve. These math to math connections should be featured in their reasoning as they show their work. This student draws each ratio of goals scored: total shots taken as a fraction, decimal and percentage to determine their response.

<u>Sample of student reasoning based on math to math connections</u>



Student work sample showing fraction, decimal and percentage connections

Black line master of grid paper



Les réponses:

Answers

Joueur	Montant de coups	les buts marqués	la fraction	le decimal	le percentage
Breanne	5	2	$\frac{2}{5}$	0.4	40%
Mark	20	5	$\frac{5}{20}$ $\frac{1}{4}$	0,25	25%
Robert	10	3	$\frac{3}{10}$	0,3	30%
Kerri	7	3	$\frac{3}{7}$	0, 429	43%

**On va choisir Kerri!