Meeting 1 Fall 2017

Let’s Try Math!

October 4th

Contents

1) Four Four Four Four
2) About Us
3) What we say
4) A Natural Disaster

www.math.uci.edu/mathceo

2017 UCI MATH CEO COMMUNITY EDUCATIONAL OUTREACH. UNIVERSITY OF CALIFORNIA AT IRVINE
Dear Mentor

In this meeting we will introduce the Math CEO program to the kids, and do four activities to serve as icebreakers and also to show our program expectations. Activities 1 and 4 have mathematical problems, whereas activities 2 and 3 will help you know your students and set the learning and behavior expectations during the quarter. Please do not run or panic if you don’t get to the finish line. The goal is not to finish, but rather that students understand.

**Math Goals**

- Kids can define in their own words what a mathematical operation is, giving several examples.

- Kids understand what a numerical expression is and how two different expressions can represent the same value (ex: 2x2 and 2+2)

- Kids use ratios and proportional reasoning to solve problems in a real context involving multiplicative relations between quantities.

- Kids understand the connections between different representations of situations of proportionality, such as ratios, equations, bar models, tables, pie charts or word descriptions.

- Kids can combine different information between ratios to produce new information, when dealing with more than 2 quantities.
MATERIALS & AGENDA

MATERIALS

INSTRUCTOR GUIDE
Green color
(No student Booklet)

MEETING REPORT
Blue color
One per table

STUDENT SURVEYS
INCLUDES QUIZZES
Pink Color
One per student

WHITEBOARDS
One per student

DRY ERASE MARKERS
A pouch with several

AGENDA

● 2:10 pm Introduction
● 2:20 pm 1) Four Four Four Four
  ○ Quiz: Problem 1 (5 min)
● 2:40 pm 2) About Us
● 3:00 pm 3) What people say
  ○ Quiz: Problem 2 (5 min)
● 3:15 pm 4) A natural disaster
● 3:40 Student Survey
● 3:45 End of the meeting

IMPORTANT!
Please count the number of markers in the pouch. Ask the students to return them to the pouches when they’re finished. Make sure that at the end, no kid takes any markers home.

End of the meeting
Collect all student surveys with all mentor’s meeting reports on top, and return to the organizers in the folder.

Make sure kids clean table and floor, and take all their belongings with them.
INDIVIDUAL ASSESSMENT

- At the end of Part 1 (Four Four Four Four), there is time for an individual Quiz (PROBLEM 1 IN THE SURVEY). Give students 5 minutes to do both parts A and B and have them answer individually (in their surveys). After collecting answers, grade them and quickly correct them with the kids.
- Right before you start Activity 4 (A Natural Disaster) make students take PROBLEM 2 of the Survey. 5 minutes. Also correct answers after students have completed the quiz.
- Parts 2 and 3 have no quiz.

TIPS
- Build the habit of having students complete the quiz in complete silence and without any help of peers of mentors. This may take a few meetings, but make perfectly clear that we will work with these expectations. Do not ignore this.

BEHAVIOR EXPECTATIONS
If a kid is behaving improperly or disrupting students, or does not follow directions at all, talk to them. If problem persists or is really serious, please let Brandi, Alessandra, Li-Sheng or an Assistant know immediately.
## UCI MATH CEO MEETINGS: BASIC GUIDELINES FOR VOLUNTEERS

<table>
<thead>
<tr>
<th><strong>1</strong></th>
<th><strong>2</strong></th>
<th><strong>3</strong></th>
<th><strong>4</strong></th>
<th><strong>5</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>KNOW YOUR STUDENTS</strong>&lt;br&gt;Call students by their names most of the time: make sure they know your name, talk briefly about their day before you start the math activities.</td>
<td><strong>ASK FOR EXPLANATIONS</strong>&lt;br&gt;Ask students how they got their answers. Say things like “How do you know?”, “Why?”, “Draw a picture”, “Convince me!”, “Can you explain to Juan?”, etc.</td>
<td><strong>MOVE &amp; MONITOR</strong>&lt;br&gt;Move around your table; monitor all students; use an adequate tone of voice; encourage kids to work in teams.</td>
<td><strong>CHECK WORK</strong>&lt;br&gt;Verify that the students write the answers to the problems and that they are correct and complete.</td>
<td><strong>AT THE END</strong>&lt;br&gt;Ask students to fill out the survey individually (no help), and to help pick up trash from the table and floor.</td>
</tr>
</tbody>
</table>

## TEACHING TIPS

This icon refers to specific tips which you will find embedded in the booklet activities: procedures, questions to ask to the students, recommended methodologies, and so on.

### Example

#### Can you explain the concept in your own words?

After you introduce a new concept, it is a good idea to ask students to rephrase the concept, explain it in their own words. You can choose particular students, for example those who are disengaged.

#### Can someone read the instructions out loud?

It is convenient to ask one student to read out instructions for a problem or definitions of a concept. This keeps your group focused on the task and improves their reading skills if you give feedback on reading.

### Activity to be done in pairs

Note: if not specified, the booklet problem can be done as a group activity involving a discussion.

#### Activity to be done in pairs

If not specified, the booklet problem can be done as a group activity involving a discussion.
Our Goals:
Use different mathematical operations in the correct order.
Understand what is an *expression* in mathematics and evaluate it correctly to obtain a numerical value.

Discuss in your group. Everyone talks.

- What is a mathematical operation? Can you give examples of mathematical operations?
- Does the order of the numbers matter when we use mathematical operations? Give different examples.
- Are the expressions $4 + 4 	imes 4$ and $(4 + 4) \times 4$ equal to the same value? Why?
Materials:

- Post it notes (around 30)

In this activity the students will cooperate by playing a game in which they create expressions, giving them points. During the game, your role is to support the learning and test for understanding. You can help and give hints, but don’t solve the problem for the students.

Tell the students that FOUR FOUR FOUR FOUR this is a cooperation game whose goal is to create all different integer values from 0 to 16 by only using the number 4, four times, with any combination of mathematical operations that they want. Students can create these values in any order they wish.

Ask a student to paraphrase the instructions to assess understanding.

Example: To obtain 16: \( 4 + 4 + 4 + 4 \), but also \( 4 \times 4 \times 4 / 4 \).

To obtain 2: \( (4 \times 4) / (4 + 4) \)

To obtain 7: \( (4 + 4) - (4/4) \).

Model any pair of examples you want to show your students, reading them carefully and writing them in a post-it note: in one side you write the expression using all different fours, and in the back you write the resulting value.

Can someone explain the instructions again to all of us?

Before we start, I’m going to show you some examples and the steps that you need to follow.
Rules of the game
Communicate these rules to students, showing examples of work that would NOT be valid.

- You need to use all the four 4’s. In your expression, the symbol 4 has to appear exactly four times.
- You may add, subtract, multiply, divide, raise numbers… any mathematical operation.
- You will need to use parenthesis when needed.
- You will need to be able to read your expression

Invalid work:
- 4 + 4 + 4: it does not have four 4’s.
- 4x4 - 4 - 4 + 4: it has more than four 4’s.
- 4 + 4 + 2 + 4: other number was used
- 4 / 4+4 x 4: Missing parenthesis? Check!

Let’s think of examples of expressions that do NOT work and why. Who can think of one?

Play
Give students a total of 8 minutes, using a timer. During that time, students can communicate amongst themselves. When they are ready to submit an answer, they write the number in a post it note:

Equal

You can work together and help each other. Set up a team plan!
Submitting an answer and assessment
When a student submits an answer, he reads the expression in the post-it note. Correct any mistakes in the reading. The way the kid reads can tell you if he understands the order of operations. You may also ask him to perform these operations, so that you see if he is applying them in correct order.

Example: Front: “4\times(4-4) + 4”. Back: “4”:
“Four times (pause) four minus four, (pause) and then plus four. This gives the value 4, because when you multiply by zero you obtain zero, and zero plus four is four”.

Once you are happy with the student’s submission, take the post it and say “Good effort, you conquered this value!”.

Scoring
Each submission of a **new value** gives 2 point. If the team submits a post-it of a value that was already submitted, but used a **new expression**, you give the team 1 point. So conquering new values is more valuable, but finding new ways to express already conquered values is also good.

Note: Don’t be strict about variation. For example, the expressions 4/4 - 4 + 4 and 4 + 4/4 - 4 are considered different. This should give kids some easy points.

Example: A team has correctly submitted 5 expressions for the value 12, one expression for the value 13 and 2 expressions for the value 15. So far their score is 11.

Variation: Let students choose before the start whether new submission are worth 2 pt and repeated values are worth 1 pt, or the other way around. Encourage them to think which is more challenging and not which is easier.

End: When time is up, give an extra 30 seconds for students to finish cards that they are working on and submit them. Add the points together and reflect with students the experiences that they lived during the game.
Some examples of correct expressions and their values

1. \(\frac{(4 \times 4)}{(4 + 4)}\) \(\rightarrow\) 2

2. \(\frac{(44 - 4)}{4}\) \(\rightarrow\) 10

3. \(4 + 4 + \sqrt{4} + \sqrt{4}\) \(\rightarrow\) 12

4. \(\frac{4}{.4} + \frac{4}{4}\) \(\rightarrow\) 11

5. \(4! - 4 \times 4\) \(\rightarrow\) 8

6. \(4 \times (4 - 4) + 4\) \(\rightarrow\) 4
TEACHING TIPS

This is a good opportunity to ask why $4 \times 4$ is equal to 16. There are several ways in which kids can answer this question:

- $4 \times 4$ is for groups of four. So two groups of 4 give me 8 and so joining these groups gives me eight plus eight, which is 16.
- Same reasoning as above, along with a picture.

Use the words “expression”, “equation” and “value” in the context of this problem, and make sure that students use them as well. You may ask for example that kids write and prove the equation indicated in the post it. Or you can ask them if they want to double check the value of the expression they wrote (when they made a mistake in the evaluation).
Some possible solutions

0: $4+4 - 4 - 4$
1: $4/4 + 4 - 4$  OR  $44/44$
2: $4x4/(4+4)$  OR  $4/4 + 4/4$
3: $(4+4+4)/4$  OR  $4 - (4^(4-4))$
4: $(4)x(4-4) + 4$
5: $4^(4-4) + 4$
6: $(4+4)/4 + 4$
7: $4+4 - (4/4)$
8: $4x4 - 4 - 4$  OR  $4^( (4/4) ) + 4$

9: $4 + 4 + (4/4)$
10: $(44 - 4)/4$
11: $44/( Sqtrt(4) + Sqrt(4) )$
12: $4x4 - Sqtrt(4) - Sqtrt(4)$  OR  $(44+4)/4$
13: $44/4 + Sqtrt(4)$
14: $4 + 4 + 4 + Sqtrt(4)$
15: $4x4 - (4/4)$  OR  $44/4 + 4$
16: $4^( (4+4)/2 ) 4x4x4/4$

Sqtrt(x) is square root of x.
Our Goals:
To bond everyone in your table (both students and mentors)
To expose kids to very basic knowledge of STEM careers

Discuss in your group. Everyone talks.

What professions do you know? Which careers can you study to work in those professions? How do these professions help people?

Which do you think are examples of STEM careers of professions? That is, careers related to Science, Technology, Engineering and Math

Look at the different images in the table. Can you discover which STEM professions are these images related to? You may use the list provided.
Material
- About Us Form for students (1 per student)
- About Us Form for mentors (1 per mentor, including no leaders)

Instructions
Tell the students that we are all (including mentors) going to fill out an About Me profile, during 10 minutes. Remind them that:
- They need to be honest, nobody will judge them
- The goal is to know each other and have fun discovering how other people think
- It is find that people are different and we can learn from others.

Time the 10 minutes. At the 5 minute mark, announce that there are only 5 minutes left and that they pace themselves.

When time is up, give students a final minute to finish their answers. After this is time to share. You may go in order question by question, or just let students talk and share answers. Make sure that:
- All students talk roughly the same (be sensitive about shy students, don't push them but still encourage them)
- Most questions are discussed, especially those about careers.
WHAT WE SAY

Our Goals:
Let students familiarize with the learning goals and values of Math CEO.
Stimulate group work
3) WHAT WE SAY

Materials: Matching paper (1 per pair of students, see next page), Puzzle (10 phrase cards).

Instructions:
Tell the students that they will receive a list of words numbered 1 to 10, and a list of ten typical phrases that people say all the time during the teaching sessions. Their job is to read each phase, highlight the part (word or words) that they like the most from it, and match it with exactly one of the ten words. Different phrases must be matched with different words.

The task will first be done in pairs while the mentor can monitor each pair. Give students 5-7 minutes to do so (help the students pace themselves).

Once time is up, have a group discussion among them to reach consensus (be a facilitator and don’t reveal yet the correct answers): for this, use the 10 big phrase cards (showing the phrases) to arrange them according to the student’s choices in a 2x5 grid (see table below: for example, the phrase matching “1 Opportunities” should go in the top right location). After that, ask some students to flip the cards to reveal the zebras image. That way students can check their answers (if the puzzle is correct, the students had all answers correct).

<table>
<thead>
<tr>
<th>1 OPPORTUNITIES</th>
<th>2 VISUALIZE</th>
<th>3 PERSEVERE</th>
<th>4 REASON</th>
<th>5 COMMUNICATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 EFFORT</td>
<td>7 CHALLENGES</td>
<td>8 RISK-TAKING</td>
<td>9 COOPERATE</td>
<td>10 REFLECT</td>
</tr>
</tbody>
</table>

Monitoring student’s work:
Observe student’s work. Specifically:

- Make sure that they highlight the words they find interesting (you may ask them why to engage in reflection).
- Make sure that students know the meanings of the ten words. If not, give examples of them in various contexts (both inside and outside of a classroom).
- Although they are some “official answers” in this activity, students may find other matchings and they should argue why. Value those choices and stress that they are not wrong, and use this to reinforce the corresponding expectation.
THINGS THAT WE SAY IN UCI

Help me understand why this is true, convince me!

It does not matter if it’s hard, what matters is that this will make me learn

I want to work with others. I learn from other people

I’m going to do the best I can, focus and listen to my mentor and peers at all times

I am sure that if I keep trying I will find a way

I will always check if my answer makes sense. How can I check? What did I do in this problem?

Do you want to try? I’m sure you can make this work

I am not afraid of making mistakes. Mistakes make me learn!

Can you draw a picture to explain this to me?

I would like to share my thoughts with you

OUR VALUES

1 OPPORTUNITIES
2 VISUALIZE
3 PERSEVERE
4 REASON
5 COMMUNICATE
6 EFFORT
7 CHALLENGES
8 RISK-TAKING
9 COOPERATE
10 REFLECT
### 3) WHAT WE SAY

**SOLUTIONS**

<table>
<thead>
<tr>
<th>1 OPPORTUNITIES</th>
<th>2 VISUALIZE</th>
<th>3 PERSEVERE</th>
<th>4 REASON</th>
<th>5 COMMUNICATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do you want to try?</td>
<td>Can you draw a</td>
<td>I am sure that if</td>
<td>Help me understand</td>
<td>I would like to</td>
</tr>
<tr>
<td>I’m sure you can</td>
<td>picture to explain</td>
<td>I keep trying I will</td>
<td>why this is true,</td>
<td>share my thoughts</td>
</tr>
<tr>
<td>make this work!</td>
<td>this to me?</td>
<td>find a way</td>
<td>convince me!</td>
<td>with you</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>6 EFFORT</th>
<th>7 CHALLENGES</th>
<th>8 RISK–TAKING</th>
<th>9 COOPERATE</th>
<th>10 REFLECT</th>
</tr>
</thead>
<tbody>
<tr>
<td>I’m going to do the</td>
<td>It does not matter</td>
<td>I am not afraid of</td>
<td>I want to work with</td>
<td>I will always check</td>
</tr>
<tr>
<td>best I can, focus and</td>
<td>if it’s hard, what</td>
<td>making mistakes.</td>
<td>others. I learn from</td>
<td>if my answer makes</td>
</tr>
<tr>
<td>listen to my mentor</td>
<td>matters is that</td>
<td>Mistakes make me</td>
<td>other people</td>
<td>sense. How can I</td>
</tr>
<tr>
<td>and peers at all times</td>
<td>this will make me</td>
<td>learn!</td>
<td></td>
<td>check? What did I</td>
</tr>
<tr>
<td></td>
<td>learn</td>
<td></td>
<td></td>
<td>do in this problem?</td>
</tr>
</tbody>
</table>

**Activity**

<table>
<thead>
<tr>
<th>Time period</th>
<th>Calories</th>
<th>Cal / min</th>
</tr>
</thead>
<tbody>
<tr>
<td>Playing Video Games</td>
<td>30 min</td>
<td>42</td>
</tr>
<tr>
<td>Walking</td>
<td>30 min</td>
<td>80</td>
</tr>
<tr>
<td>Running</td>
<td>10 min</td>
<td>115</td>
</tr>
<tr>
<td>Dancing</td>
<td>30 min</td>
<td>200</td>
</tr>
<tr>
<td>Jumping Rope</td>
<td>1 min</td>
<td>10</td>
</tr>
</tbody>
</table>
A NATURAL DISASTER

Our Goals:
Represent relations between numbers in different ways, using pictures and ratios
Given a ratio and one value, understand how to find the other value.

Discuss in your group

What types of natural disasters do you know? Why do they happen?
Which professions do you think are helpful in helping people when a natural disaster occurs? How so?
In a natural disaster, the ratio firefighters to nurses is 6 : 4. From this information, what can we conclude and what can’t we conclude about the number of these workers?
A NATURAL DISASTER

Materials: 8 Clue cards and 1 Price Table.

Instructions: Read or explain this problem to your students:
There has been a natural disaster in a town and you want to help the community buy six items, one of each type. You have traveled to a city nearby, in which the currency is not US dollars, but Goopies. Your job is to tell your team the exact price to pay, in Goopies and also in US dollars, if you are to buy one of each of the items in the list shown. Follow the 8 clues that you receive and complete the information requested.

Give the clue cards and the price table to the students. They will work cooperatively to solve the problem. Clues are numbered but students are free to analyze them in any order.

- 1 Walkie Talkie
- 1 Meal
- 1 Flashlight
- 1 Water tank
- 1 First Aid Kit
- 1 Jacket

The Goopie is the currency of the place you just arrived to.

Your final goal is to find out the price to pay to buy one of each of the items shown: 1 Walkie talkie, 1 meal, 1 flashlight, 1 water tank, 1 first aid kit and 1 jacket.

Read the clues given in any order to help you reach your goal, and enjoy helping others!!
CLUE 1

With the money to buy 4 Jackets I could buy exactly 9 Flashlights.

\[ 4 \text{ Jackets} = 9 \text{ Flashlights} \]

Decide:

Which item is more expensive? Select one:
( ) Jacket    ( ) Flashlight

How do you know this?

Complete:

I can buy exactly ____ Jackets with the same money that I can buy 27 Flashlights.

CLUE 2

The price of 2 Jackets is equal to the price of 3 First Aid Kits, as shown in the Bar model.

Decide:

Which item is more expensive? Select one:
( ) Jacket    ( ) First Aid

How do you know this?

Complete:

1. Jacket costs the same as ______ First Aid Kits.
CLUE 3

One Walkie Talkie would buy me two and a half Flashlights.

\[ 1 \text{ W} :: 2.5 \text{ F} \]

Decide:
Which item is more expensive? Select one:
( ) Walkie Talkie ( ) Flashlight

How do you know this?

Complete the bar model:

Walkie Talkie Walkie Talkie

Draw the corresponding number of bars for flashlights

CLUE 4

The price of 2 meals equals to 1.5 times the price of a flashlight.

Decide:
Which item is more expensive? Select one:
( ) Meal ( ) Flashlight

How do you know this?

Complete the table:

Price Equivalences

<table>
<thead>
<tr>
<th># of meals</th>
<th># of flashlights</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>1.5</td>
</tr>
<tr>
<td>6</td>
<td></td>
</tr>
</tbody>
</table>
CLUE 5

The ratio of prices between a Meal and a Water Tank is of $2 to $18. So, if a Meal’s price were $2, a Water tank would cost $18.

Decide:
Which item is more expensive? Select one:
(   ) Meal  (   ) Water Tank

How do you know this?

Complete:
_____ meals can buy me _____ ::
_____ water tanks.

CLUE 6

I paid a total of 1800 Goopies to buy 1 Jacket and 1 Water Tank. The Pie Chart shows the percentages of the total spent in each item.

Pie Chart: Price Percentages

Decide:
Which item is more expensive? Select one:
(   ) Water Tank  (   ) Jacket

How do you know this?

Complete:
If I sell 9 Jackets, I could buy a total of _____ water tanks with that money.
CLUE 5

The picture represents a price equation:

Decide:
What is more expensive? Select one:
( ) First Aid Kit       ( ) Walkie Talkie

How do you know this?

Complete:
The ratio of price between one First aid Kit and one Walkie Talkie is _____ : _____.

CLUE 6

The unit price ratio Meal : Flashlight is 4 : 3.

Decide:
What is more expensive? Select one:
( ) Meal       ( ) Flashlight

How do you know this?

Complete:
If I sell 9 Flashlights, I could buy ____ meals with that money.
### CLUE 7

6 walkie talkies would buy me 20 meals.

**Decide:**

What is more expensive? Select one:
- ( ) Meal
- ( ) Walkie Talkie

**How do you know this?**

**Complete:**

Complete the picture adding the missing meals to balance the equation.

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= =
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### CLUE 8

The total money shown in the picture is worth $US 220. There are dollars and several 500 Goopie (G) bills.

**Decide:**

What is more expensive? Select one:
- ( ) One dollar
- ( ) One Goopie

**How do you know this?**

**Complete using your own words:**

To convert from dollars to goopies, we need to __________
The following table shows the different prices of each type of item:

<table>
<thead>
<tr>
<th>Item</th>
<th>Price G</th>
<th>Price $USD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meal</td>
<td>150</td>
<td>6</td>
</tr>
<tr>
<td>Flashlight</td>
<td>200</td>
<td>8</td>
</tr>
<tr>
<td>First Aid Kit</td>
<td>300</td>
<td>12</td>
</tr>
<tr>
<td>Jacket</td>
<td>450</td>
<td>18</td>
</tr>
<tr>
<td>Walkie Talkie</td>
<td>500</td>
<td>20</td>
</tr>
<tr>
<td>Water Tank</td>
<td>1350</td>
<td>54</td>
</tr>
</tbody>
</table>

Note: 1 $USD = 25 G

- This problem has several clues of several levels of difficulty. If you are rushed with time, you may choose only a few clues to let your students work on.
- Insist that there are several ways to use the clues and to complete what is being asked. Compare different student answers and representations.
- In the “decide” parts of the clue, insist and push students to justify their answers. Don’t be happy with they saying that it’s obvious. Give them roads of reasoning: for example: can you think of a similar example? What if we pretend that the item costs this many dollars? Can you see a general rule between ratios and costs? Can you convince me with a picture? What would happen if this were not the case?
- The clues can be solved in any order, but if your group feels a bit weak in the concepts, you should suggest that they follow them in order.
- Make sure that kids can learn models and techniques from one clue to apply in a different one.
Solution to some clues. Click to watch the video.

For more videos: https://www.math.uci.edu/~mathceo/meetings.php
Additional Resources

(we will have them at the meeting in your table)
THINGS THAT WE SAY IN UCI

Help me understand why this is true, convince me!

It does not matter if it’s hard, what matters is that this will make me learn

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OUR VALUES

1 OPPORTUNITIES
2 VISUALIZE
3 PERSEVERE
4 REASON
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</tr>
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</tr>
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<td>Jumping Rope</td>
<td>1 min</td>
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<td></td>
</tr>
<tr>
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<td>Activity</td>
<td>Time</td>
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<tr>
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</tr>
<tr>
<td>1</td>
<td>Playing Video Games</td>
<td>30 min</td>
<td>42</td>
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<tr>
<td>2</td>
<td>Walking</td>
<td>30 min</td>
<td>80</td>
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<tr>
<td>3</td>
<td>Running</td>
<td>10 min</td>
<td>115</td>
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<tr>
<td>4</td>
<td>Dancing</td>
<td>30 min</td>
<td>200</td>
</tr>
<tr>
<td>5</td>
<td>Jumping Rope</td>
<td>1 min</td>
<td>10</td>
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</table>

1. OPPORTUNITIES
2. VISUALIZE
3. PERSEVERE
4. REASON
5. COMMUNICATE
6. EFFORT
7. CHALLENGES
8. RISK-TAKING
9. COOPERATE
10. REFLECT
We will remove the words once we are done putting the pictures (although we save a copy of the slides for mentors to know).
<table>
<thead>
<tr>
<th>STEM PROFESSIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aerodynamicist</td>
</tr>
<tr>
<td>Allergist</td>
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<tr>
<td>Andrologist</td>
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<tr>
<td>Archeologist</td>
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<tr>
<td>Astrobiologist</td>
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<tr>
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<tr>
<td>Astronomer</td>
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<tr>
<td>Astrophysicist</td>
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<tr>
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<td>Chemist</td>
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<tr>
<td>Chiropractor</td>
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<tr>
<td>Climatologist</td>
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<tr>
<td>Dermatologist</td>
</tr>
<tr>
<td>Doctor</td>
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<tr>
<td>Ecologist</td>
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<tr>
<td>Economist</td>
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<tr>
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<tr>
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<td>Immunologist</td>
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<tr>
<td>Inventor</td>
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<tr>
<td>Limnologist</td>
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</tr>
<tr>
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<td>Scientist</td>
</tr>
<tr>
<td>Statistician</td>
</tr>
<tr>
<td>Surgeon</td>
</tr>
<tr>
<td>Urologist</td>
</tr>
<tr>
<td>Veterinarian</td>
</tr>
<tr>
<td>Volcanologist</td>
</tr>
<tr>
<td>Zoologist</td>
</tr>
</tbody>
</table>
CLUE 1

With the money to buy 4 Jackets I could buy exactly 9 Flashlights.

\[ 4 \text{ Jackets} = 9 \text{ Flashlights} \]

Decide:

Which item is more expensive? Select one:

( ) Jacket   ( ) Flashlight

How do you know this?

Complete:

I can buy exactly ____ Jackets with the same money that I can buy 27 Flashlights.

CLUE 2

The price of 2 Jackets is equal to the price of 3 First Aid Kits, as shown in the Bar model.

Decide:

Which item is more expensive? Select one:

( ) Jacket   ( ) First Aid

How do you know this?

Complete:

1. Jacket costs the same as
   _______ First Aid Kits.
**CLUE 3**

One Walkie Talkie would buy me two and a half Flashlights.

1 \( W \) :: 2.5 \( F \)

**Decide:**
Which item is more expensive? Select one:
( ) Walkie Talkie  ( ) Flashlight

*How do you know this?*

**Complete the bar model:**

walkie talkie  walkie talkie

*Draw the corresponding number of bars for flashlights*

**CLUE 4**

The price of 2 meals equals to 1.5 times the price of a flashlight.

**Decide:**
Which item is more expensive? Select one:
( ) Meal  ( ) Flashlight

*How do you know this?*

**Complete the table:**

<table>
<thead>
<tr>
<th>Price Equivalences</th>
</tr>
</thead>
<tbody>
<tr>
<td># of meals</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>6</td>
</tr>
</tbody>
</table>
The ratio of prices between a Meal and a Water Tank is of $2 to $18. So, if a Meal’s price were $2, a Water tank would cost $18.

Decide:
Which item is more expensive? Select one:
( ) Meal  ( ) Water Tank

How do you know this?

Complete:
____ meals can buy me ___ ::
____ water tanks.

I paid a total of 1800 Goopies to buy 1 Jacket and 1 Water Tank. The Pie Chart shows the percentages of the total spent in each item.

Decide:
Which item is more expensive? Select one:
( ) Water Tank  ( ) Jacket

How do you know this?

Complete:
If I sell 9 Jackets, I could buy a total of ____ water tanks with that money.
CLUE 5

The picture represents a price equation:

The ratio of price between one First aid Kit and one Walkie Talkie is _____ : _____.

CLUE 6

The unit price ratio Meal : Flashlight is 4 : 3.

If I sell 9 Flashlights, I could buy ____ meals with that money.

Decide:
What is more expensive? Select one:
( ) First Aid Kit  ( ) Walkie Talkie
How do you know this?

Complete:
The ratio of price between one First aid Kit and one Walkie Talkie is _____ : _____.

Decide:
What is more expensive? Select one:
( ) Meal  ( ) Flashlight
How do you know this?

Complete:
If I sell 9 Flashlights, I could buy ____ meals with that money.
CLUE 7

6 walkie talkies would buy me 20 meals.

Decide:
What is more expensive? Select one:
( ) Meal ( ) Walkie Talkie
How do you know this?

Complete:
Complete the picture adding the missing meals to balance the equation

CLUE 8

The total money shown in the picture is worth $US 220. There are dollars and several 500 Goopie (G) bills.

Decide:
What is more expensive? Select one:
( ) One dollar ( ) One Goopie
How do you know this?

Complete using your own words:
To convert from dollars to goopies, we need to ________
A Natural Disaster: Price Table (1 per group)

<table>
<thead>
<tr>
<th>Item</th>
<th>Price G (Goopies)</th>
<th>Price $USD (Dollars)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meal</td>
<td>![Meal Icon]</td>
<td></td>
</tr>
<tr>
<td>Flashlight</td>
<td>![Flashlight Icon]</td>
<td></td>
</tr>
<tr>
<td>First Aid Kit</td>
<td>![First Aid Kit Icon]</td>
<td></td>
</tr>
<tr>
<td>Jacket</td>
<td>![Jacket Icon]</td>
<td></td>
</tr>
<tr>
<td>Walkie Talkie</td>
<td>![Walkie Talkie Icon]</td>
<td></td>
</tr>
<tr>
<td>Water Tank</td>
<td>![Water Tank Icon]</td>
<td></td>
</tr>
</tbody>
</table>

Describe the Relation between Dollars and Goopies:

Explain which strategy you used to fill the Price Table.

How much do I need to pay in total? Explain how you got the answer.