Unit 3 - Module D : Lesson 1

Bartering for Beginners

Introduce the idea of bartering and how it connects to equality and proportional reasoning.

CCSS content goal(s): 6.EE.B.5, 6.EE.B.6, 6.EE.B.7

Standards for Mathematical Practice: MP2, MP3, MP4, MP7, MP8

Student Friendly Objective
I can use critique and describe fair trades in bartering and purchasing contexts.
I can interpret, evaluate and solve equations in problem contexts.

Agenda

Phase	Est Time	Description
Launch	5 min	Students work individually (2 min) Slide 1: (Question 1) Warm up with the Which One Doesn't Belong (WODB) pictures of animals. For this activity there are no wrong answers, students just need to justify why their choice is unique. Class Discussion (3min) Engage in a brief class discussion encouraging as many students to explain what they chose. Make sure to get at least one response for all animals shown. The more responses you get, the more likely a students will mention something you have not thought of!
Engage	4 min	Student write Slide 2: (Question 2) Let students write out their thoughts on what bartering/trading is and how they have experienced it. Class Discuss After a couple minutes of writing, discuss as a class some examples the students came up with. You can visit these sites for

		some fun historical facts about [money](#)/[bartering](#). Some students might be familiar with more recent digital approaches to exchange funds for services (like Venmo, Zelle, CashApp) and cryptocurrency. The key idea is to highlight that when we make trades, we tend to try to be as fair (or equal) as possible. Discussing student experiences helps to engage students in the content and prepare for subsequent discussions that will occur in this lesson.
Explore	6 min	**Whole Class Discussion (or work in pairs/groups)** **Slide 5:** (Question 3) Students practice a trade in context. Allow students a minute or two to think up a strategy to solve this problem. Then in small groups, have students discuss strategies and come up with a solution. Have some groups share their solution, and discuss as a class the methods that were used. **Slide 6:** (Questions 4abc) This question prompts students to recognize that when trading, there are different ideas of fairness when considering the objects traded. A really lame video game might be worth 10 cards but an awesome game might be worth 30 cards.
Explore	5 min	**Whole Class Discussion** **Slide 7:** (Question 5) As a class, discuss students' strategies for finding what might be used on the 3rd scale. Recognize that the scales are showing the weight of the items.
Explore	8 min	**Individual work (or pair/small group)** **Slide 8:** (Question 6) Let students demonstrate their creativity in their problem solving strategies. They use pictures, scales or any other method showing equality or trades. Students should be able to explain their work and how they obtained a solution. Having students document their strategy helps to support their working memory.
Extend	10 min	**Individual/Small group Work** **Slides 9 - 12** **Slides 10 & 11:** (Question 7) The equations in this question stay within the shopping context and are set up so that the variables have different meanings in each equation. Be sure to check 7c either individually or as a class to make sure the meaning of the variables are understood for both contexts. **Small Group Work or Whole Class Discussion** **Slide 12:** (Question 8) These questions are for real world considerations of what equality means. Engaging in class

		discourse around fair pay is encouraged for question 12b. Things to consider when discussing fair pay: education required for the work, cost of living in the area where the work is performed, overtime pay, time spent performing the work, physical vs mental labor, etc.
Closing	1 min	Summary

Slide 13: These brief statements are to provide some closure and reflection on the bartering and trading contexts and their connection to equality. The meaning of variables in different problem contexts is important to think about, so students recognize how math is used to model realistic situations. |
| Practice | 5 min | Individual Practice

Slide 14: (Questions 9 - 14) Have students solve some (or all) of these equations for the value of the variable. As the first lesson in this module, if students have limited experience with solving one-step equations this section can be skipped. |

Lesson Description

Students will explore equality through the idea of bartering.

Student Responses

1. Example responses:
    a. Top left does not belong because it is the only one with a hat.
    b. Top right does not belong because it is the only animal that spends most of the time in water.
    c. Bottom left does not belong because it is the only animal without feet shown.
    d. Bottom right does not belong because it is the only spotted animal.

2. Student answers will vary. Example, I define bartering as trading. I like to trade for food because other people usually have different snacks than I usually bring for myself.

3. 60 cards = 3 games ⇒ 20 cards = 1 game (students may set up equivalent ratios, divide, use intuition or draw out pictures. Make sure any method used is justifiable).

4. a. May avoid the trade if they want your favorite video game or if the cards they are getting rid of are not very good. This shows the trade being unfair or unequal.
    b. The friend could have included a soda or a favor. This again tries to get back to the idea of equal trading and perceived value of an object.
    c. Students may list various trading goods. The idea is to recognize that when there is consistent lack of fairness when trading can be a sign of being taken advantage of. This happens in the real world all the time in local business and global trade which is why it is good to know what something is worth before you try to sell or buy it.

5. **Solution: 1 box of pasta**.   Example work: 2 pears = 1 cheezit and 2 boxes of pasta= 1 cheezit means 2 pears=2 boxes of pasta so 1 pear = 1 box of pasta.

6. **Solution: 4 cookies total**
    Give students time to grapple with this.   Example work below.
    You have 4 apples and 1 milk
    4 carrots = 1 popcorn
    2 cookies = 8 carrots
    2 popcorns = 1 milk
    2 carrots = 1 apple

    4 apples = 8 carrots = 2 cookies
    1 milk = 2 popcorns = 8 carrots = 2 cookies

    Solution: 4 cookies total!

7. a. Some possibilities:
            0 Cheerios and 4 goldfish and 0 pineapples,
            0 Cheerios and 0 goldfish and 8 pineapples,
            4 Cheerios and 1 goldfish and 0 pineapples
            2 Cheerios and 1 goldfish and 3 pineapples

    b. 3 goldfish = $12 and 6 pineapples = $12.
       The variables here represent the *cost of each item*

    c. In part a, *g* stood for the **amount of goldfish bags** whereas in part b, *g* is the **cost per bag of goldfish**

d. This equation could represent a purchase of two groups of each item for a total price of $20.

e. If the variables represent the prices for each item, then this equation would be false. Two times the price of each item would be $18, not $20.

f. Answers will vary. The set of three items would need to be priced at $10 for two sets of the same items to cost $20. So any combination of prices for c, g, and p that is a sum of $10 would make this equation true.

8.
a. $2,250 per month

b. *Responses may vary, see below for examples.*
Here are some arguments that may arise: The farm is profiting $78,750. This is more than three quarters what they are paying their workers. There may be high operating costs or other incentives, like food and lodging, that the farm is providing their workers.

c. $4,000 per farmer

d. $45w = 180000$

Practice problems
9.   x = 330

10. m=¼

11. p=1

12. f = 8

13. r = 2

14. a = 144