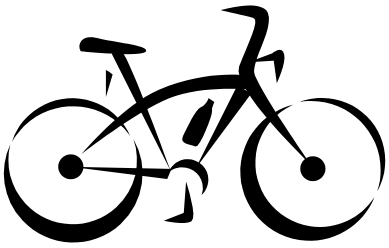
Performance Task: Wheel Shop



Approximately 2 days Adapted from the Noyce Foundation

STANDARDS FOR MATHEMATICAL CONTENT

MCC.1.OA.1. Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.

MCC.1.OA.2. Solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.

MCC1.OA.5. Relate counting to addition and subtraction (e.g., by counting on 2 to add 2).

STANDARDS FOR MATHEMATICAL PRACTICE

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

BACKGROUND KNOWLEDGE

Provide opportunities for students to participate in shared problem-solving activities to solve word problems. Collaborate in small groups to develop problem-solving strategies using a variety of models such as drawings, words, and equations with symbols for the unknown numbers to find the solutions. Additionally students need the opportunity to explain, write and reflect on their problem-solving strategies. The situations for the addition and subtraction story problems should involve sums and differences less than or equal to 20 using the numbers 0 to 20.

ESSENTIAL QUESTIONS

- How do you determine a missing addend?
- How can we represent a group of objects with numbers?
- How can we show and explain our thinking?

MATERIALS

- Wheel Shop Pictures
- The Wheel Shop Recording Sheet
- Make Twenty Game
- Four sets of 0-20 Cards

GROUPING

small group/partners/individual

TASK DESCRIPTION, DEVELOPMENT AND DISCUSSION

Part I
Gather all students to a common area. Ask, "What do we call this? (show a picture of a bicycle) How many wheels does a bicycle have? Who can show me how they know there are two wheels? What if I have two bicycles, how many wheels would I have?" Allow students to come up with an answer and share their strategies for determining the number of wheels.

Next, the teacher shows a picture of a go-cart, and asks, "What do we call this? How many wheels does a go-cart have? What if I had two go-carts?" Allow for responses and discuss the strategies used to determine how many wheels.

Part II
Using drawings, equations, and written responses, students work cooperatively or independently to solve.

The Wheel Shop sells bicycles and go-carts. Each bicycle has only one seat and each go-cart has only one seat. There are a total of 7 seats and 18 wheels in the shop.

How many are bicycles and how many are go-carts?
Explain how you figured it out.

Part III
Students should work with partners or within small groups of 4 to play *Make Twenty Game*. Groups will need 4 sets of 0-20 cards. Each player is dealt three cards and the rest of the cards are placed in a face down pile. The first player picks up a card from the pile and checks to see if he is able to make 20 and still discard one card. If he cannot, he discards a card (face up) and player two picks up a card from the face down pile or picks up the top card in the discard pile. The first player to make 20 wins.

FORMATIVE ASSESSMENT QUESTIONS

- How did you know the number of bicycles? Go-carts?
- What strategy did you use to determine this?
- Can you write an equation/number sentence to show your thinking?
- Is this the only solution? How do you know?

DIFFERENTIATION

Extension

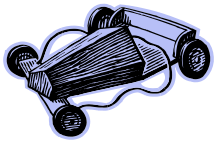
- To extend their thinking include a tricycle. There could be 5 seats and 19 wheels.

Intervention

- Provide students with the amount of bicycles and go-carts, and ask them to determine the number of wheels.

Name:_____ **Date:**_____

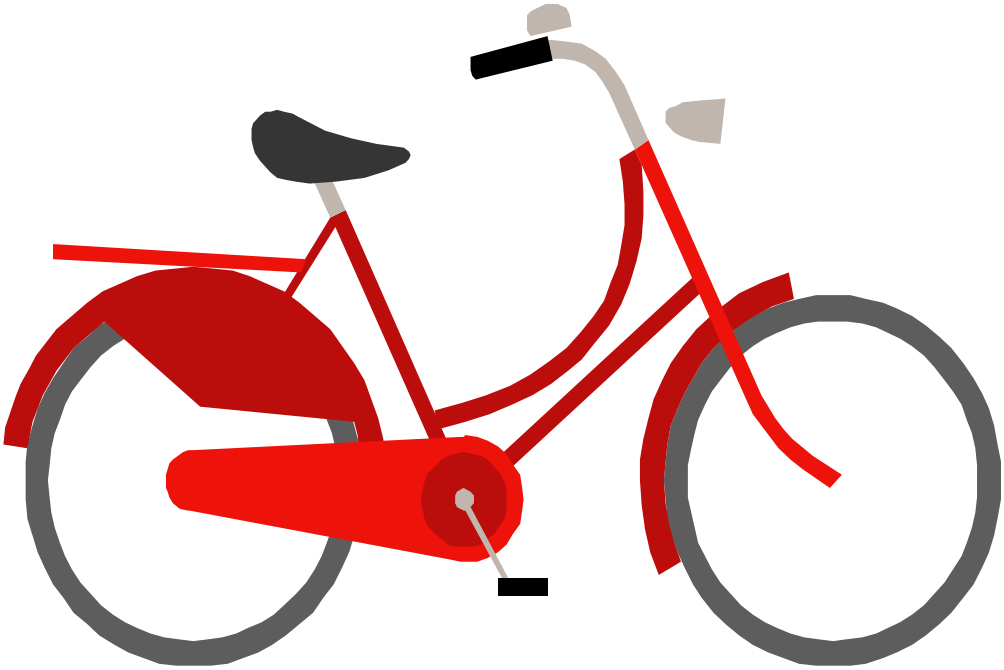
The Wheel Shop

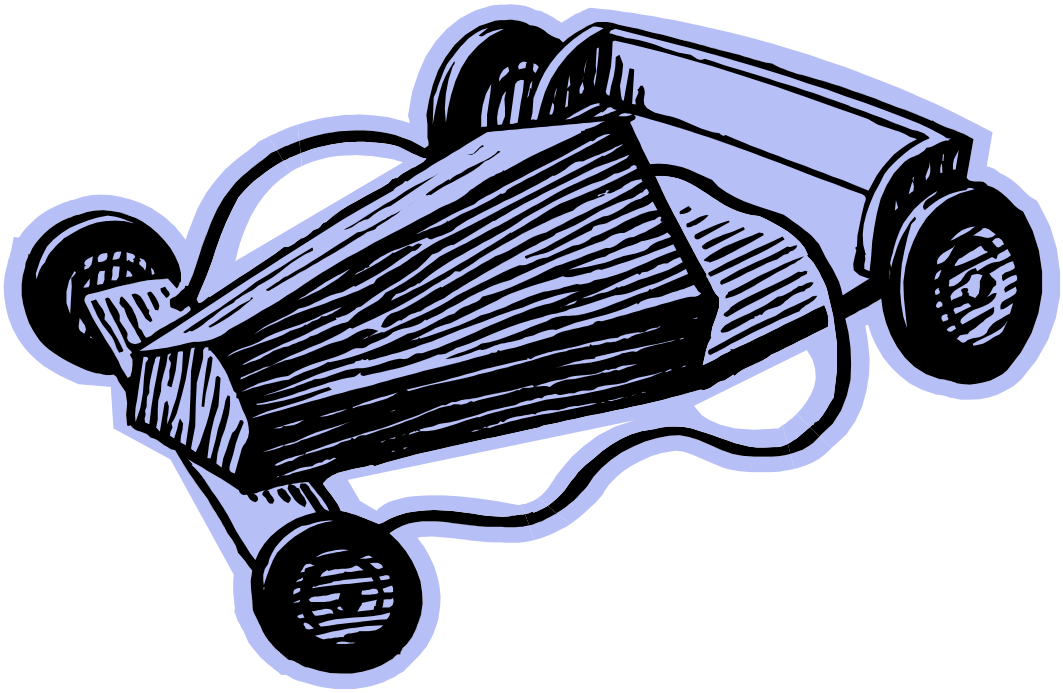


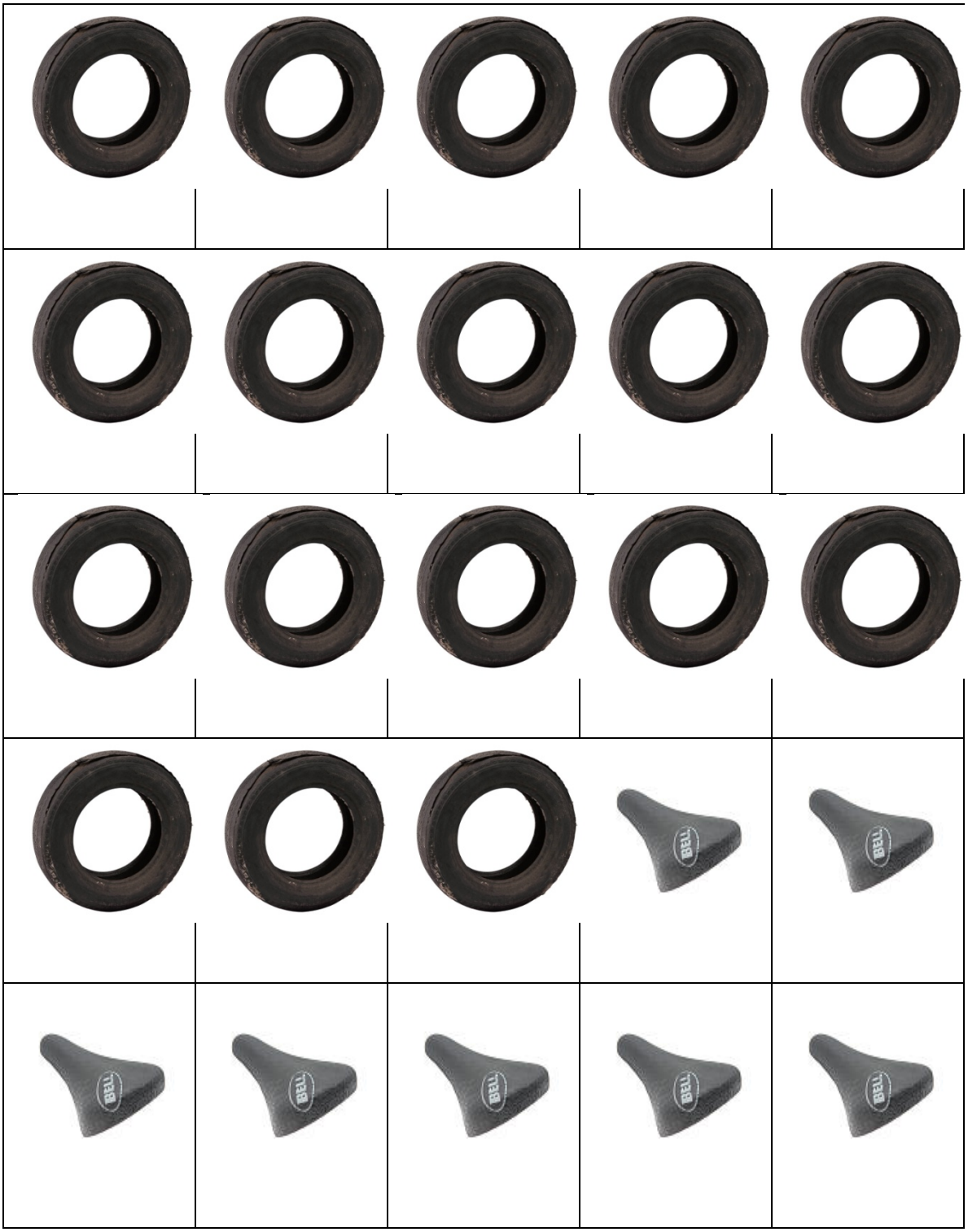
The Wheel Shop sells bicycles and go-carts. Each bicycle has only one seat and each go-cart has only one seat. There are a total of 7 seats and 18 wheels in the shop.

How many are bicycles and how many are go-carts?

Use pictures, words, and numbers to show your math thinking.







Make Twenty

Skills/concepts: Addition

Materials: 4 sets of number cards (0 to 20)

Number of Players: 2 to 4

Directions: Each player is dealt three cards and the rest of the cards are placed in a face down pile.
The first player picks up a card from the pile and checks to see if he is able to make 20 and still discard one card. If he cannot, he discards a card (face up) and player two picks up a card from the face down pile or picks up the top card in the discard pile. The first player to make 20 wins.

Variation 1: Deal 8 cards to each player and try to make as many combinations that make 20 as possible. Combinations can be put down as soon as they are made. The game ends when one player has no cards left after discarding one and putting down the combinations to 20. Winner has the most sets to make 20.

Variation 2: Change the target sum to a number between 10 and 20.

0	1	2
3	4	5
6	7	8
9	10	11
12	13	14
15	16	17
18	19	20