

Problem Solvers Activity 17: Things with Wheels

CHILDREN ARE LEARNING TO...¹

- Sort and classify objects by one attribute into two or more groups, with increasing accuracy.
- Compare visually (with or without counting) two groups of objects that are obviously equal or nonequal and communicate "more" or "same." (48 months)
- Understand that adding an object will increase the number of objects in the group.

MATERIALS NEEDED:

A small collection (4-6) of toy vehicles, including a least one piece of construction equipment (like a dump truck) and one car/taxi/bus (used to transport people)

10 small blocks, all one color

10 small blocks of a second color

Glue or tape

Handout 1: Things with Wheels

Handout 2: Toddler Dice

Handout 3: Animal Cards (for the optional **Build on the Book** activity)

Handout 4: Sets for "One More" Song

PREPARATION:

- Gather 6-8 wheeled toys, including vehicles used to transport people and construction equipment. Set aside for the **ENGAGE** activity.
- Print **Handout 1** in color and cut the cards apart. You may wish to laminate the cards for future use. Set one of each type of card aside for the **EXPAND** activity: a backhoe, a dump truck, a cement mixer, an ambulance, a fire truck, and a car.
- Print two copies of the toddler dice on heavy paper. Cut out each dice and use glue or tape to assemble. Alternatively, you can make your dice by using a cube block; place a small square of masking tape on each side and draw the appropriate number of dots. (Use **Handout 2** as a model.)
- Photocopy **Handout 4** and cut out each set of circles if you plan to do the song activity.
- Prepare copies of the parent handout for distribution.
- If you plan on implementing the optional book activity, refer to the preparation instructions (including **Handout 3**) as noted.

¹ California Department of Education (2008). Preschool Learning Foundations. Retrieved from <https://www.cde.ca.gov/sp/cd/re/documents/preschoollf.pdf>

Activity Instructions

ENGAGE

Gather a group of 4 children on the floor or at a table.

Display the wheeled toys, which should include both vehicles used to transport people and construction equipment.

SAY: Look, Problem Solvers, I have a collection to share with you today! Take a look at these toys. What do you see? Have you ever seen any of these vehicles in your neighborhood? What do these vehicles do in real life?

Facilitate a conversation about children's experience with and knowledge of these vehicles. Allow children to play with/explore these toys while they discuss.

ASK: What do you notice about this set of toys? How are they alike?/What is the same about these vehicles? [All have wheels. All have doors, headlights, etc.] What are some of the ways they are different? [Any answer is okay. Responses might focus on color but also could focus on how the vehicle is used, size, number of people that can sit, etc.]

SAY: Let's explore vehicles some more—and talk about what makes them the same and different.

EXPAND

Place the following cards *face up* on one side of the table: a backhoe, a dump truck, a cement mixer, and ambulance, a fire truck, and a car. Place the remaining **Things with Wheels** cards *face down* in the center of the table.

Point to the cards that are face up.

SAY: Look at the pictures on these cards. How are they alike? [Each shows a vehicle with wheels.] How are they different? [Children may point out their different colors, sizes, or uses. They may notice that some are used to build things, or carry people, or help in an emergency.]

Encourage children to explore their ideas. There are no wrong answers. You may wish to write down the differences children notice on a whiteboard or piece of paper.

SAY: Let's see if we can choose cards from this pile [point to the cards that are face down] to make sets of things that are alike.

Pick a card from the face-down pile, show children the picture, and ask if they know its name. Place it on top of the card that matches and explain your choice: *I matched these two cards because each one has a shovel on the back.*

Select a volunteer to choose and sort the next card. Continue selecting and sorting cards until no cards are left.

NOTE: The car cards are NOT exact matches. Each car card is a different color/style. This might provoke discussion with children on whether they belong in the same pile or not. Either answer—"yes, the same" or "no, they're different colors" is okay. Teachers can support this discussion by asking the questions explored above: How are they the same? How are they different? If children opt for separate piles, suggest children combine the car cards for the next part of the activity (counting and comparing).

NOTE: The vehicle cards produce the following sets:

- 5 cars
- 4 firetrucks
- 3 dump trucks
- 3 cement mixers
- 2 backhoes
- 1 ambulance

ASK: What can we do to find out if we have more cars or more dump trucks?

Ask for two volunteers to count each set of cards. Describe the relationship between the two sets: *When you counted, you learned that there are 5 cars and 3 dump trucks. Do we know which set has more?* (Listen to children's thinking about this question.)

NOTE: Understanding which numbers are larger than others means that children understand the sequence of the number line—which is an advanced skill that emerges over time. Until this skill fully developed, providing a one-to-one comparison as shown below helps children see/understand the concept that 5 is larger than 3.

SAY: Let's use a strategy to discover which set has more.

Ask for children to help you line up each set of cards so that it is easy to see which set's cards extend the farthest in a line (see illustration below). Point out how there are more car cards than dump truck cards: "We can see that there are more car cards in our set—1, 2, 3, 4, 5. And there are 3 dump trucks—1, 2, 3. So a quantity of 5 is larger than a quantity of 3."



Prompt children to compare the quantities in the remaining sets of cards by creating lines of cards for visual comparisons.

Together, identify the set of vehicles that has the MOST cards (cars—5) and the set of vehicles that has the LEAST cards (ambulance—1). Another approach: ask children to point out which set is the LARGEST and which set is the SMALLEST.

ASK: Are there any sets that have the same number? Tell me how you know (dump trucks and cement mixer—3 each). Yes, they each have an EQUAL number of cards.

Transition: Let's try to make a different kind of set using blocks.

EXPLORE

Lead the activity outlined below as a group for children aged 2.5 to 3.5.

Implement the activity outlined below as a partner activity—for children aged 3.5 to 4 years. Create pairs of children. Give each pair a set of 10 blocks—5 of one color to Partner A, 5 of the other color to Partner B.

Choose a pair of children to model the activity.

SAY: Let's play a game called *One More!* Here's how it works. Partner A [Name the child] will roll the dice. Then, they will count the dots and make a set of blocks that has the same number. Then Partner B [Name the child] will make a set that has *one more* block in it. Ready? Let's try it together one time.

Have the children start by counting their blocks before they begin. Each partner should have 5.

Give Partner A the dice and ask them to toss it. Prompt them to count the dots on top; if needed, provide support by pointing to each dot as they count it. When the child is done counting, repeat the number to reinforce it: *You rolled a 3. Now you can make a set of 3 blocks.*

Wait for the child to make a set of 3 blocks. Provide support if needed by counting aloud with the child or prompting the child by pointing to a block and saying, "Here's number one..." and then pausing to see if they continue counting independently.

SAY: Now, I'd like Partner B to make a set of blocks that has *one more*. Problem Solvers, can you help them figure out what to do? [If children don't suggest it, illustrate how to line Partner B's blocks up to show one more than Partner A. Children may also suggest counting out 3 blocks, and then choosing one more. Both strategies are fine.]

When the child is done, line the two sets of blocks up next to one another so children can see which set is larger and which is smaller. With children, count each line of blocks, pointing to each one as you do. When done, observe: "Partner A had 3 blocks. Then Partner B made a set of 4 blocks. 4 is one more than 3!"

Once children understand the game, let them play on their own. Children should switch roles halfway through so each has a chance to roll the dice and make a set of "one more."

Observe children as they play. If children are having difficulty making or counting sets, you might say, "Let's line up the blocks so we can see your sets and compare them. Let's be Problem Solvers and point to each block when we count it, so we don't miss any!"

Observe children and if they are counting/comparing accurately, you can re-state their discovery: "Partner A has 4 blocks and Partner B has 3 blocks. 4 is one more than 3."

REFLECT

Debrief the activity using questions such as the following:

- What trucks or vehicles did you like best? Why?
- What was tricky about figuring out which set of vehicles had more?
- What did you do to figure out which sets had more and less?
- What did you do to make a set of blocks with "one more"?

Individualizing the Activity

MAKE IT MORE CHALLENGING:

- Have children consider the 18 **Things with Wheels** cards and suggest their own "sorting rules" (other ways to sort the cards), for example, yellow vehicles and all other colors, or vehicles that help the community and other vehicles.
- Sort cards into 3 sets. For example, you can sort cards by size: make a set of small vehicles, BIG vehicles, and vehicles that are in between (medium-sized).
- Sort the cards by one attribute (like size) and then sort the cards again by a **different** attribute (like color). It is quite difficult for children to shift their perspective and organize sets differently after an initial sort. Preschoolers may need some support to see that vehicles can be sorted multiple ways.
- In the **Paired Partners Activity**: Once children have played *One More* for several rounds, switch the rules and suggest partners make sets of "one less" or sets that are "two more." You can also switch to typical dice that show quantities up to 6 (be sure to provide children with at least 7 blocks each).

MAKE IT LESS CHALLENGING:

- Reduce the number of cards from 18 to 10-12.
- Remove the set of cars so all cards in the **EXPAND** activity have an exact match.
- In the **EXPLORE** activity, have partners make equal sets instead of "one more."

MAKING CONNECTIONS ACROSS THE DAY:

- Compare sets of 5 and under as they occur throughout the day. Which set has more or less (or are they equal?): mittens or gloves? Round crackers or square crackers? Green crayons or purple crayons?
- Use picture labels on bins to help children sort and put toys away.
- If you notice leaves on the ground outside, try to sort them into piles of leaves that are the same. Can the children find the tree they fell from? Which pile of leaves has more?
- In the **EXPLORE** activity, have partners make equal sets instead of "one more."
- Notice vehicles in your community or parking lot. Point out those vehicles that are the same in some way (red cars or blue cars) and those that are different (trucks vs. cars).
- Encourage sorting in centers as children play. Ask them to compare items in terms of their similarities and differences.

Song: *One More*

Materials Needed: Handout 4, cut into strips

Directions: For each verse, create the set indicated and then line up the next set below it to show “one more.” Alternatively, use cube blocks to create the sets as indicated by the lyrics—or ask the children to help you create these sets of blocks, pausing the song as needed.

Here we have a set of one.
Counting sets has just begun!
Compare that to this set of two.
You know it’s one more; you do!
1-2.

Now, we’ll make a set of two!
Making sets is fun to do!
Next we’ll place this set of three.
Three is just one more, you see!
1-2-3.

Come and count along with me;
Let’s count this set... 1-2-3.
Now we’ll count this set of four.
Let’s compare; there’s just one more.
1-2-3-4.

Here we have a row of four, now
Make a set with just one more.
As we count, we will arrive
With a row that numbers five!
1-2-3-4-5!

Counting and comparing sets
I think that’s the best it gets!

Making Literacy Connections

Share the following book with children as an opportunity to deepen their understanding of matching and sorting. The literacy extension activity below suggests another play-based experience to invite children to observe attributes that make mother and baby animal a “match.”

Suggested Book: *Is Your Mama a Llama?* by Deborah Guarino

Is Your Mama a Llama? is the rhyming story of a baby llama looking for his mother. He encounters a baby bat, swan, cow, seal, and kangaroo in his search. As each baby animal describes its mama, the baby llama realizes that she’s a different animal altogether. This book’s focus on attributes and matching (baby to mama) gives children an opportunity to extend the learning from the group activity.

AS YOU READ:

- Show the picture on the cover of the book and explain that the main character of this story is a baby llama. Ask children to describe him and tell what they think a mother llama might look like.
- As each new character is introduced, ask the children if its mother could be a llama. How is the animal like a llama (if at all)? How is it different?

- Pause before you turn each page that reveals the mother animal and see if children can guess what the animal is based on the rhyme.
- When you reach the final pages, ask how Baby Llama feels when he finds his mom. What do the children notice in the pictures that helped them figure this out? Ask children how they feel when they see a family member they love.
- Make a connection between the book and the child's real life. Ask children if they have a pet at home (cat dog, fish, rabbit, et.). What do they think their pet's mama looked like?

BUILD ON THE BOOK

Materials: Flannel board, piece of flannel or a roll of hook-and-loop fastener (like Velcro®), and animal cutouts from **Handout 3**.

Preparation: Cut the animals apart, glue to cardboard (if desired), and add flannel or hook-and-loop fastener to the back of each.

SAY: Problems Solvers, today we are going to read *Is Your Mama a Llama* together. We will help Baby Llama find his mother.

Display the Baby Llama card. Ask children to describe Baby Llama. What kind of fur does he have? Do you see his ears? He has legs, but they're tucked under his body. How many legs do you think he has? What will Mama Llama look like?

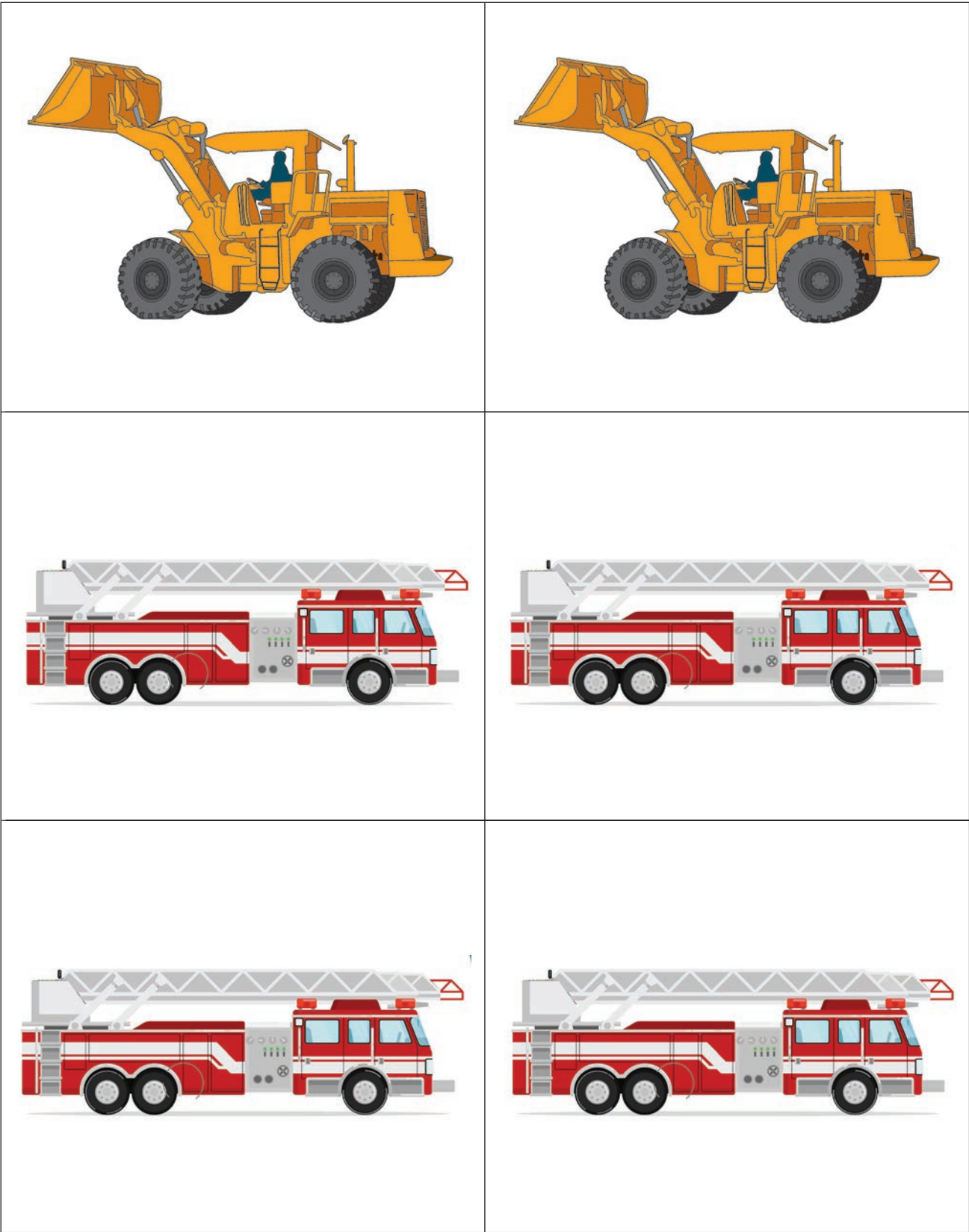
Display all pictures except the Mama & Baby Llama photo on the flannel board. Read the book together. As each baby animal describes its mother, ask a volunteer to choose the picture that matches. Help children point out the attributes in the picture that are described in the text. When Baby Llama has found his mother, display the picture of the two llamas and note the similarities.

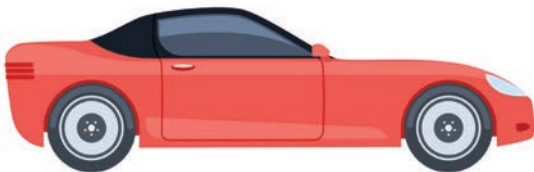
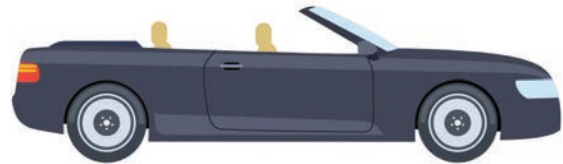
Suggest categories and help children sort the flannel board characters into different sets:

- animals that fly vs. those that don't
- those that swim vs. those that don't
- that have big ears vs. those that don't
- that have fur vs. those that don't

Encourage the children to return to the book and flannel board characters during free play and retell the story in their own way.

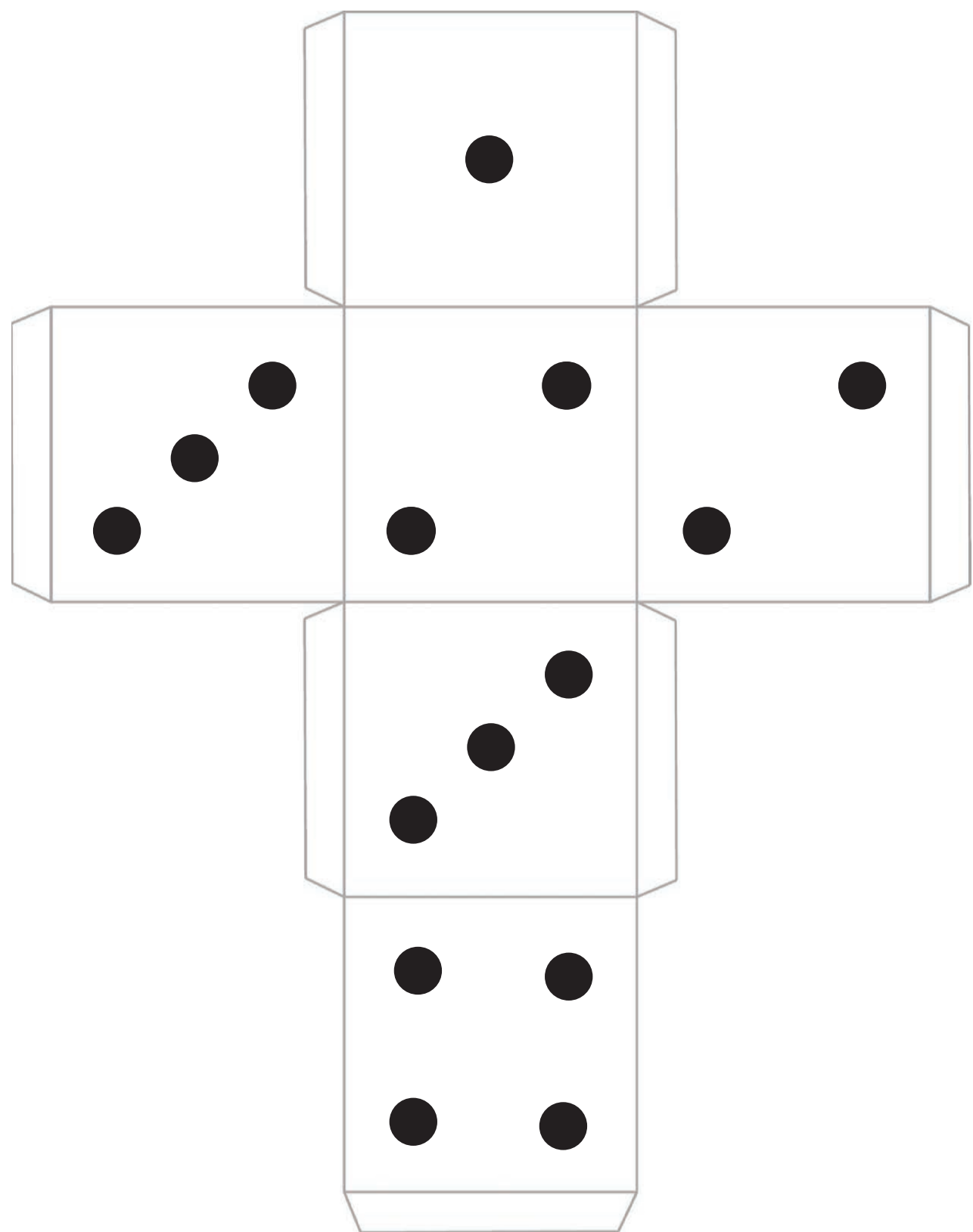
Handout 1: Things with Wheels







Handout 2: Toddler Dice

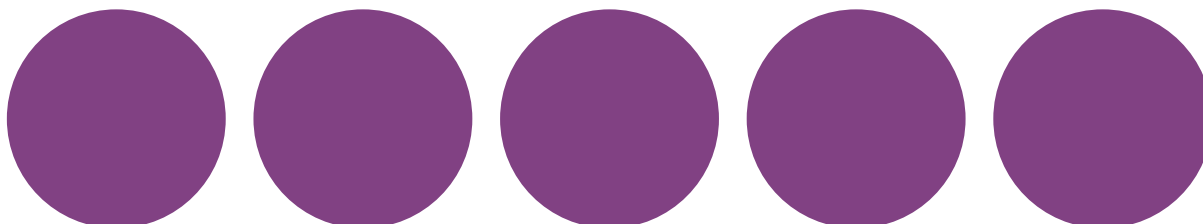
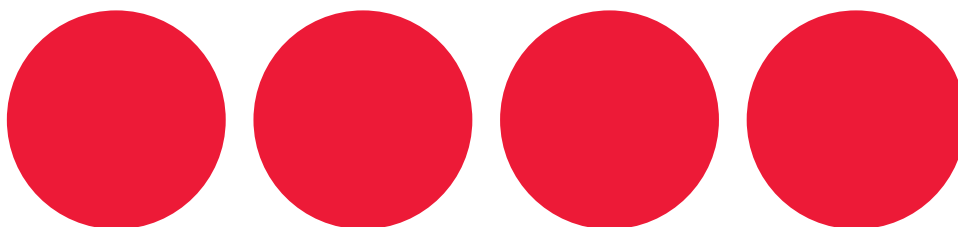
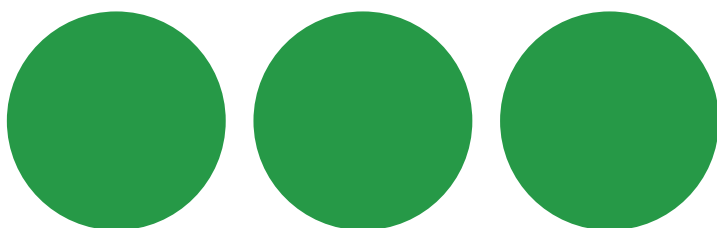
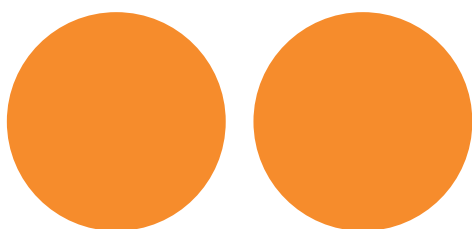
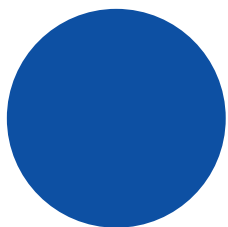


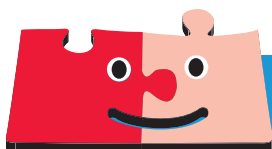
Handout 3: Animal Cards





Handout 4: Sets for "One More" Song





Comparing Sets

A set is a collection of things with something in common. The person making the set decides on the rule for including objects or leaving them out. For example, we can make a set of fruits and a set of vegetables. Or we can separate our set of fruits into a set of apples and a set of oranges.



Here are two activities you can try at home to support your child's understanding of sets.

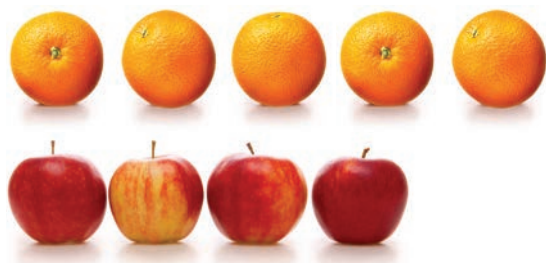
What's our rule?

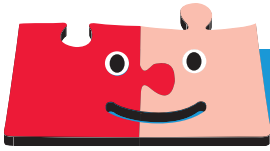
Take a group of similar objects and look at them with your child. Talk about how they are the same or different. Together, decide on a rule for making sets. For example:

- A collection of silverware can be separated into sets of forks and spoons
- A collection of toy cars can be separated into sets by color
- A group of socks can be separated into sets of striped socks and solid socks

Which set has more?

When you are done making sets, look at your collections. Help your child figure out how many are in each set. Which set has more? Which set has less? Keep in mind your child is still learning to count so will still need your help with this part! You can help your child compare two sets and see which has more by lining the objects up next to each other, like this:





Solo para familias

Comparar de conjuntos

Un conjunto es una colección de cosas que tienen algo en común. La persona que hace el conjunto decide la regla para incluir objetos o dejarlos fuera. Por ejemplo, podemos hacer un conjunto de frutas y un conjunto de verduras. O bien, podemos separar nuestro conjunto de frutas en un conjunto de manzanas y un conjunto de naranjas.



Aquí hay dos actividades que puede probar en casa para ayudar a su hijo a comprender los conjuntos:

¿Cuál es nuestra regla?

Tome un grupo de objetos similares y examínelos con su hijo. Hable acerca de cómo son iguales o diferentes. Juntos, decidan una regla para hacer conjuntos. Por ejemplo:

- Una colección de cubiertos se puede separar en conjuntos de tenedores y cucharas
- Una colección de autos de juguete se puede separar en conjuntos por color
- Un grupo de calcetines puede separarse en conjuntos de calcetines de rayas o calcetines sólidos

¿Qué conjunto tiene más?

Cuando haya terminado de hacer conjuntos, mire sus colecciones. Ayude a su hijo a averiguar cuántos hay en cada conjunto. ¿Qué conjunto tiene más? ¿Qué conjunto tiene menos? ¡Tenga en cuenta que su hijo todavía está aprendiendo a contar, por lo que aún necesitará su ayuda con esta parte! Puede ayudar a su hijo a comparar dos conjuntos y ver cuál tiene más alineando los objetos uno al lado del otro, así como estos:

