READY FOR SCHOOL WITH STEM

MATH

ENGINEERING

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Unit Name: Numbers and Operations in Base Ten: Ten = 10

What are we doing? We will break down (decompose) and make up (compose) numbers 1-20, and learn to identify small numbers of objects by sight without counting them (subitize).

Purpose/Why? Children begin working on base ten understanding in kindergarten. Working and playing within 10 sets the foundation for this understanding.

- Kindergarten Readiness is the ability to combine and separate up to five objects and describe the parts, and to recognize the number of up to five objects instantly. For example, your child may say, "I have five beads. Three are red and two are white." (*Characteristics of Children Entering Kindergarten - WaKIDS*)
- Kindergarten Readiness is the ability to count 10–20 objects accurately, know that the last number states how many in all, and tell what number comes next in order when counting from 1–10. (*Characteristics of Children Entering Kindergarten - WaKIDS*)
- Children ages 4-5 may identify by sight how many are in a small group of objects, up to four. (*Washington State Early Learning and Development Guidelines – OSPI*)
- Children ages 4-5 may find the sum when joining two sets of up to five objects. (*Washington State Early Learning and Development Guidelines – OSPI*)
- Children age 5 and Kindergarten may add and subtract numbers up to ten using objects or drawings. (*Washington State Early Learning and Development Guidelines – OSPI*)

Materials Provided: Rubber ducks; laminated ten-frame; Rekenrek; foam die

You will need to provide: 10-20 objects (buttons, beans, bottle caps, crayons, Cheerios®, paper clips, LEGO® bricks, blocks, etc.) to use with the ten-frame as counters; paper and a crayon/marker/pencil.

Books:
"Ten Little Rubber Ducks" by Eric Carle
"Ten Black Dots" by Donald Crews

Vocabulary Builder:

- Number words (1-20) example: ten, eleven, twelve, etc.
- Ordinal number words example: first, second, third, fourth, etc.
- Comparative words example: longer, shorter, more, less, fewer, equal, same, greater
- Decompose a number
- Compose a number

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- Subitize
- Addition
- Subtraction
- Pattern
- Combination
- Sets

 **Ask a Question:** How many do you see? How do you know? How many ways can we make up that number? How many are left?

 **Quick Start:** Start simply by reading the books together. Ask your child "How many dots or ducks do you see? Count them for me. Or let's count together."
Ask your child to create groups of five and ten with objects from around the house (socks, books, blocks, silverware, etc.).

Rubber Ducks

 **Quick Start:** Count the ducks from 1-20.

1. Play hide and seek with rubber ducks, starting with just five. Hide the ducks around the room and send your child on a duck hunt. As your child finds each duck ask them to count the ducks one by one. "You've found two ducks! How many are left? How do you know?"
2. When all the ducks have been collected, ask your child "How many do you see? Can you tell me without counting them one by one? How do you know?"
3. Ask your child to group the ducks into sets (collections) and show you the many ways to make up five. "How many combinations can you make?" One and four, three and two, five ones, one one, and two twos, one three and two ones, and so on.
4. This is also a great opportunity to introduce and practice positional (geometry) vocabulary, using descriptive words to identify where the ducks are found, and ordinal numbers (first, second). Ask "Where did you find the duck?" and prompt "This duck is under the pillow and that duck is behind the door. The third duck is on top of the stove, the fourth duck is beside the TV."

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Deeper Dive: Play hide and seek with 10-20 ducks. Once all ducks have been found, ask your child to make a group of ten. "How many ones are left over? How many ducks did you find? How do you know?"

Ten-Frame: A ten-frame helps your child see what makes up ten and what may be left over (the ones) in larger numbers.

Quick Start: Have your child roll the foam die. "How many dots (pips) do you see? Can you tell me without counting them one by one? Let's subitize!" Place the corresponding number of counters on your ten-frame. "How many counters are there? How many squares are empty? How many more counters do we need to fill the frame? How do you know?" Contrasting counters to empty squares helps your child to see the ones that make up ten more clearly.

Deeper Dive: Explore numbers 11-20 by rolling the die two, three, or even four times or naming a number from 11-20. Fill in the ten-frame with counters and ask what is left. For example: "Rolls of 4, 6, and 5 make 15. We have one group of ten and five ones left over."

Rekenrek: For an under 4-minute introduction to the Rekenrek in an actual kindergarten classroom, checkout this video from Mathematically Minded at https://youtu.be/B4_YvwpIQwU

Quick Start:

1. Let your child play with and explore the Rekenrek and then ask: "What do you notice about the Rekenrek?" If they need prompting, ask "What colors do you see? How many beads are there? How many of each color do you see? Which color has more? How do you know? Which line has more beads, the top or the bottom, or are they the same? How do you know?

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2. Start playing with the Rekenrek using just the top line (10 beads), covering the bottom row with a piece of paper as needed. Start by pushing all the beads to the right. Slide beads to the left, so the Rekenrek is read from left to right. Say a number from 1-10 or have your child roll the die. "Move the beads to show me ___. Slide the beads on the top row to the left to show me ___." Your child may need to slide the beads one by one—that's okay! We're working up to subitizing and recognizing numbers as a whole rather than as their individual parts. The Rekenrek with its different colors and line arrangement will help your child to visualize numbers in groups.
3. Find different ways to make a given number. Slide all the red beads to the left, all the white beads to right. Ask your child to roll the die or say a number from 1-10. "How many ways can we build this number? Let's record all the different ways we can find on your paper."
4. Your turn! Slide the beads on the Rekenrek to create a number from 1-10. Show the Rekenrek briefly to your child and then hide it away. Ask your child to draw what they saw on a piece of paper. Ask "What number did you see?" and "How do you know?".

Deeper Dive: Use both lines of the Rekenrek to compose numbers from 1-20. Roll the die 3 times (or tell your child a number) and ask them to move the beads to show you the number. "Is there another way to show __? How do you know that's the number?"

Practice sliding beads in groups rather than one by one. Tell your child to slide all the beads to the right. Ask your child to count the first three beads in their mind and on the count of three, slide all three beads at once across the string. "Show me the number by moving the beads with just one push."
Repeat with the other number, five beads, ten. Now we're subitizing and recognizing numbers in a set without counting them individually.

"Can you show me one less? (subtract) One more? (add) Five less? Five more? Ten?"

Show Me; Show a Friend: Buddy up with a friend on the Rekenrek. Work together to build a number. Take turns. "I'm going to slide two beads on the top row. You slide beads on the bottom row to build the number five." "I'm going to slide 8 beads on the top row, you slide beads on the bottom to make 15." "How can we make that number another way? How many ways can we find?"

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Other Activities:

- Make your own version of Donald Crews' *Ten Black Dots* using paper, crayons, or markers, and sticker dots or bingo daubers. Ask your child to use from 1-20 dots to make their own pictures. Label the pictures with the numeral and a description provided by your child that uses the corresponding number word, for example "Four black dots can make the wheels on the monster truck" or "Three pink dots can make the buttons on my shirt." Ask your child to put the pages in order from one to ten/whatever and fasten the pages together. As you read the book together, ask your child to identify other things that might have the same number of dots. (Source: "Ten Black Dot Extension Activities")
- Make your own Rekenrek. You'll need a piece of cardboard or craft foam, two pipe cleaners/craft stems, a ruler, a knife or pair of scissors, 20 pony or biggie beads (10 in one color and 10 in another), and tape. Cut a 4" x 6" rectangle out of the foam or cardboard. Using a ruler, make 4 faint marks 1" from the sides and 1" apart where you'll poke the pipe cleaners through. Poke pipe cleaners through the marks at one end of the rectangle and fold the ends down on the back side. Slide five beads of one color onto each pipe cleaner. Slide another five beads of the other color onto each. Poke the free ends through the remaining marks. On the back side, twist the ends of the pipe cleaners together and tape down the point bits.
- As you fill your cart at the store, ask your child to count the items and create groups of five or ten. "Can you make a group of five items? How many ways can you make a group of ten?" "Six bananas and four cans. Two bottles and two pizzas and six eggs."
- Play with numbers 1-10 through fingerplays and finger counting games like "Five Little Monkeys," "Five Green and Speckled Frogs," "Ten in a Bed," and "This Old Man," helping your children move beyond finger counting to recognizing through subitizing that one hand has five fingers and two hands have ten.
- Read counting books that focus on counting to 20 and beyond like *Billions of Bricks: A Counting Book About Building* by Kurt Cyrus, *Chicka Chicka 1, 2, 3* by Bill Martin Jr. and Michael Sampson, *Let's Count to 100!* by Masayuki Sebe, *1-20 Animals Aplenty* by Katie Viggers, *Pete the Cat and the Missing Cupcakes* by Kimberly and James Dean, *Sheep Won't Sleep: Counting by 2s, 5s, and 10s* by Judy Cox, and *The Very Cold Freezing No-Number Day* by Ashley Sorenson.