

Measurement

Unit 11 Overview: 9 lessons

Children find what can be measured about a thing (how long or tall it is, how heavy, how much it holds) and compare two things directly: side by side from one start line, standing on one floor, in their hands or on a pan balance, and by pouring. There are no rulers in this unit. The goal is the words, said in full sentences: “The pencil is longer than the crayon.” Compare real things first, then pictures. Lessons 11.7 (putting three things in order), 11.8 (measuring with cubes) and 11.9 (counting the blocks that balance a thing or the cups that fill it) are for the states that teach them in Kindergarten.

THE UNIT, DAY BY DAY

Day 1	Pre-Check	What children already know (page 1 of the test pack).
Day 2	11.1 What can we measure?	I can tell what a tool measures.
Day 3	11.2 Longer and shorter	I can tell which is longer and which is shorter.
Day 4	11.3 Taller and shorter	I can tell which is taller and which is shorter.
Day 5	11.4 Bigger and smaller	I can tell which is bigger and which is smaller.
Day 6	11.5 Heavier and lighter	I can tell which is heavier and which is lighter.
Day 7	11.6 Holds more or less	I can tell which holds more and which holds less.
Day 8	11.7 Put things in order ★	I can put three things in order.
Day 9	11.8 Measure with cubes ★	I can measure with cubes that touch, with no gaps.
Day 10	11.9 Blocks and cups ★	I can count the blocks or cups that measure a thing.
Day 11	Unit Review	The review pages, with a tip beside every question.
Day 12	Unit Test	Form A, read aloud to small groups; Form B (other pictures and numbers) is for a retest.

★ Taught in Kindergarten in some states. Skip these lessons if yours teaches them in another grade; animalmath.com/standards shows your state's list.

GET READY FOR THE UNIT

- A tub of things to compare for each table: pencils, crayons, ribbons, spoons, blocks, toy animals, fruit
- Linking cubes, and masking tape for a start line on the rug and on each table
- A pan balance (a hanger with two cups on strings works too) and same-size blocks
- Cups, bowls, jars and a pitcher, with rice or water to pour, and a towel for spills

HOW EACH LESSON GOES

1. **Warm up** (5 min)
 2. **Teach** (10 min)
 3. **Try it together** (5 min)
 4. **Practice** (10 min)
 5. **Exit ticket** (5 min): a quick check on the lesson.
- Each lesson page ends with the Animal Math sheets, makers, tools and quizzes for it. “Sheet 3” is the third worksheet of a pack; a color pack prints each sheet again in black and white.

CHECKING AS YOU GO

EXIT TICKET	Kindergarten Measurement Exit Tickets: one for every lesson, two to a page
PRINTABLE	Kindergarten Measurement Test: the Pre-Check, the Unit Review and the Unit Test (Forms A and B), with keys



Measurement

Lesson 11.1: What can we measure?

GOAL Children find that one thing can be measured in more than one way (how long or tall it is, how heavy it is, how much it holds) and name a tool that tells each.

About 35 minutes

I can tell what a tool measures.

THE LESSON

- 1 Warm up** (5 min) Play Simon Says with measuring words: "Simon says stretch out long. Simon says stand tall. Simon says lift something heavy."
- 2 Teach** (10 min) Hold up a water bottle and ask what we could find out about it: how tall it is, how heavy it is, how much water it holds. Show a tool for each: a ruler tells how long, a balance tells how heavy, a measuring cup tells how much it holds. This year children compare without the ruler.
Say: "We can measure how long it is, how heavy it is and how much it holds. Each one has its own tool."
- 3 Try it together** (5 min) Pass around a shoe and a bowl. For each, children say one thing we could measure ("how heavy") and point to the tool mat that tells it.
- 4 Practice** (10 min) Each child takes a thing from the tub and tells a partner two ways to measure it, pointing to a tool mat for each. Then show the three sheets listed below and ask what each one compares: how long, how heavy, how much it holds. Children finish them in later lessons.
- 5 Exit ticket** (5 min) Read **Exit Ticket 11.1** aloud, one question at a time. Children answer, then circle a face as you read the "I can" line. Both questions show the same three tools in a new order: check that the second answer is the cup, not the balance again.

Ready for more? Draw a thing from home and the tool that would measure it, then tell the class what the tool tells.

GET READY

- A water bottle, a shoe and a bowl to talk about
- A ruler, a pan balance and a measuring cup to show
- Three mats with a picture of each tool

WORDS TO USE

long: how far it goes from one end to the other

heavy: how hard it pulls down in your hands

holds: how much fits inside, like water or rice

ASK

- What can we find out about this shoe?
- Which tool tells how heavy something is?
- What does a measuring cup tell us?

WATCH FOR

Says "big" for every way to measure. Ask "Big how? Long, heavy, or holds a lot?" and show the tool for each.

Thinks the balance tells how big a thing is. Put a beach ball and a block on it: the balance tells how heavy, not how big.

Need help? Talk about one way at a time: hold two things and say which is heavy, before naming tools.

ON ANIMAL MATH

PRINTABLE **Big and Small Animals: Comparing Size:** sheet 4, to name what it compares: how long

PRINTABLE **Heavier or Lighter?** sheet 1, to name what it compares: how heavy

PRINTABLE **Holds More, Holds Less:** sheet 1, to name what it compares: how much it holds

EXIT TICKET **Kindergarten Measurement Exit Tickets:** Exit Ticket 11.1

Measurement

Lesson 11.2: Longer and shorter

GOAL Children compare two lengths by lining up one end of each at a start line and looking at the other ends, and say which is longer and which is shorter.

About 35 minutes

I can tell which is longer and which is shorter.

THE LESSON

- 1 Warm up** (5 min) Hold up a long ribbon and a short crayon. Children stretch their arms wide for longer and bring their hands close for shorter as you point to each.
- 2 Teach** (10 min) Hold a pencil and a crayon with their ends at different places, so the crayon looks longer, and ask which is longer. Then lay both at the tape with their ends on the start line and look at the other ends: the pencil is longer. Do it again with a curled ribbon, straightened first.
Say: "First I line up the ends. Then I look at the other ends. The pencil is longer; the crayon is shorter."
- 3 Try it together** (5 min) Partners pick two things from the tub, line them up at the tape and say "The ____ is longer than the ____," then say it the other way with shorter.
- 4 Practice** (10 min) Children circle the longer animal on sheet 4 of Big and Small Animals, then the longer and the shorter one on sheet 1 of Comparing and Ordering Lengths. Read each direction aloud: the bottom half asks for the shorter one.
- 5 Exit ticket** (5 min) Read **Exit Ticket 11.2** aloud, one question at a time. Children answer, then circle a face as you read the "I can" line. The second question asks for the shorter one: watch for children who circle the longer one out of habit.

Need help? Compare things that are very different in length first (a cube and a jump rope), on the tape line.

Ready for more? Find something longer than your arm and something shorter than your hand, or play the Compare level of the Measuring Length quiz with an adult beside them.

GET READY

- Pairs of things in a tub (a pencil and a crayon, two ribbons, a spoon and a key)
- Masking tape for a start line on each table

WORDS TO USE

longer: it goes farther; its end sticks out past the other one

shorter: it stops first

start line: where we line up the ends

ASK

- Which one is longer? How do you know?
- Why do we line up the ends first?
- The ribbon is longer than the crayon. So which one is shorter?

WATCH FOR

Looks at one end only when the other ends are not lined up. Slide both to the start line, then look again.

Picks the thicker thing as longer. Line them up: longer means the end goes farther, not that it is bigger.

Circles the longer one when asked for the shorter. Say it both ways: the ribbon is longer than the crayon, so the crayon is shorter.

ON ANIMAL MATH

PRINTABLE

Big and Small Animals: Comparing Size: sheet 4

PRINTABLE

Comparing and Ordering Lengths: sheet 1

QUIZ

Measuring Length Quiz: the Compare level

EXIT TICKET

Kindergarten Measurement Exit Tickets: Exit Ticket 11.2

Measurement

Lesson 11.3: Taller and shorter

GOAL Children compare two heights by standing things side by side on the same floor or table, and say which is taller and which is shorter.

About 35 minutes

I can tell which is taller and which is shorter.

THE LESSON

- 1 Warm up** (5 min) Children grow up tall when you say “taller” and shrink down small when you say “shorter”, faster and faster.
- 2 Teach** (10 min) Stand two children back to back on the rug and lay a book across their heads: who is taller? Then build two cube towers and stand the shorter one on a book: is it taller now? No, they must stand on the same table. Take it off the book and compare the towers side by side.
Say: “We stand them on the same floor, side by side. The one that goes up higher is taller.”
- 3 Try it together** (5 min) Pairs build cube towers, stand them side by side and say “My tower is taller than yours” or “shorter than yours.” Then each builds one taller than the partner’s.
- 4 Practice** (10 min) Children circle the taller one in each box on sheet 3 of Fall Measuring: both things in a box stand on the same line, so children compare the tops (the acorns are there to count, too). Early finishers stack the paper blocks on sheet 4 of Cut and Measure and tell which is taller.
- 5 Exit ticket** (5 min) Read **Exit Ticket 11.3** aloud, one question at a time. Children answer, then circle a face as you read the “I can” line. The first question asks for the shorter tower, the second for the taller flower: read each one slowly.

Need help? Compare two towers that are very different (2 cubes and 8 cubes) before towers that are close.

Ready for more? Find something in the room taller than the table and something shorter than a chair.

GET READY

- Linking cubes to build towers
- Things to stand up: a toy giraffe, a cup, a bottle, a block
- A big book to lay across two heads

WORDS TO USE

taller: it goes up higher, from the same floor

shorter: it does not go up as high

side by side: right next to each other, on the same floor

ASK

- Which is taller? How can you tell?
- Why do they need to stand on the same floor?
- Can you build a tower shorter than mine?

WATCH FOR

Compares things that stand on different floors. Move both onto the table, side by side, and look again.

Says “bigger” for “taller”. Give the word: “Yes, it goes up higher: it is taller.”

Circles the taller one when asked for the shorter. Point to the word as you read it, and say both: this tower is taller, so that one is shorter.

ON ANIMAL MATH

PRINTABLE

Fall Measuring: sheet 3 (circle the taller one; the acorns are there to count, too)

PRINTABLE

Cut and Measure with Nonstandard Units: sheet 4 (stack blocks, then compare)

EXIT TICKET

Kindergarten Measurement Exit Tickets: Exit Ticket 11.3

Measurement

Lesson 11.4: Bigger and smaller

GOAL Children compare two things and say which is bigger and which is smaller, then find the biggest of three.

About 35 minutes

I can tell which is bigger and which is smaller.

THE LESSON

- 1 Warm up** (5 min) Call out animals: children make themselves as big as an elephant, as small as an ant, as big as a bear, as small as a mouse.
- 2 Teach** (10 min) Hold up a big and a small teddy bear. Ask which is bigger and which is smaller, and say the sentence both ways. Then show nesting cups: the smaller cup fits inside the bigger one. Add a third cup and find the biggest.
Say: "This bear is bigger. That bear is smaller. The small cup fits inside the big cup."
- 3 Try it together** (5 min) Partners take two toys from the tub and say "The ____ is bigger than the ____." Then they find something in the room bigger than a book and something smaller than a crayon.
- 4 Practice** (10 min) Children circle the bigger animal in each box on sheet 1 of Big and Small Animals and the smaller one on sheet 2. Early finishers circle the biggest in each row on sheet 3.
- 5 Exit ticket** (5 min) Read **Exit Ticket 11.4** aloud, one question at a time. Children answer, then circle a face as you read the "I can" line. Each question shows one picture in two sizes: the first asks for the bigger lion, the second for the smaller orange.

Need help? Compare two things that are very different in size first, holding one in each hand.

Ready for more? Put three nesting cups in order from smallest to biggest, or circle the biggest on sheet 3 of Big and Small Animals.

GET READY

- A big and a small teddy bear (or two balls)
- Nesting cups
- Pairs of toys of one kind in two sizes

WORDS TO USE

bigger: it takes up more room

smaller: it takes up less room

biggest: bigger than all the others

ASK

- Which is bigger? How do you know?
- Why does the small cup fit inside the big one?
- Which animal in this row is the biggest?

WATCH FOR

Circles the bigger one when asked for the smaller. Read the word with a finger under it, and say both: this one is bigger, so that one is smaller.

Says "taller" or "longer" for bigger. Take the word, then add one: "Yes, and it is bigger: it takes up more room."

ON ANIMAL MATH

PRINTABLE

Big and Small Animals: Comparing Size: sheets 1-2, and sheet 3 (the biggest of three) for more

EXIT TICKET

Kindergarten Measurement Exit Tickets: Exit Ticket 11.4

Measurement

Lesson 11.5: Heavier and lighter

GOAL Children compare two things by holding one in each hand and on a pan balance, and say which is heavier and which is lighter: the heavier side goes down.

About 35 minutes

I can tell which is heavier and which is lighter.

THE LESSON

- 1 Warm up** (5 min) Children pretend to carry something heavy (a big rock, a full backpack), then something light (a feather, a bubble).
- 2 Teach** (10 min) A child holds an apple in one hand and a cotton ball in the other: which hand pulls down? Put both on the balance and watch the apple side go down. Then weigh the beach ball and the small block: the small thing is heavier.
Say: "The heavier side goes down. The lighter side goes up. Big does not always mean heavy."
- 3 Try it together** (5 min) Pairs hold two things, guess which is heavier, then check on the balance and say "The ____ is heavier than the ____."
- 4 Practice** (10 min) Children circle the heavier one on sheet 1 of Heavier or Lighter? and the lighter one on sheet 2. Point to the lower pan with them first.
- 5 Exit ticket** (5 min) Read **Exit Ticket 11.5** aloud, one question at a time. Children answer, then circle a face as you read the "I can" line. The second balance asks for the lighter one: it is on the side that goes up.

Need help? Compare two things that are very different (a book and a feather) in the hands before using the balance.

Ready for more? Sheet 3 of Heavier or Lighter?: is the small picture heavier, lighter or the same?

GET READY

- A pan balance (or a hanger with two cups on strings)
- Pairs to weigh: an apple and a cotton ball, a block and a feather, a book and a crayon
- A beach ball and a small heavy block

WORDS TO USE

heavier: it pulls down more; it is harder to lift

lighter: it is easy to lift; it goes up on the balance

balance: a tool with two sides; the heavier side goes down

ASK

- Which side went down? What does that tell you?
- Is the bigger thing always heavier?
- How can you check with your hands?

WATCH FOR

Thinks the side that is up is heavier. Push down on one pan with a finger: heavy things push down like that.

Picks the bigger thing as heavier. Weigh the beach ball and the block again: big can be light.

Circles the heavier one when asked for the lighter. Read the word with a finger under it: the lighter side goes up.

ON ANIMAL MATH

PRINTABLE **Heavier or Lighter?** sheets 1-2, and sheet 3 for more

EXIT TICKET **Kindergarten Measurement Exit Tickets:** Exit Ticket 11.5

Measurement

Lesson 11.6: Holds more or less

GOAL Children compare two containers by pouring from one into the other, and say which holds more and which holds less.

About 35 minutes

I can tell which holds more and which holds less.

THE LESSON

- 1 **Warm up** (5 min) Show a full cup, a half full cup and an empty cup. Children stretch up tall for full, crouch down for empty and stand halfway for half full.
- 2 **Teach** (10 min) Fill a cup with rice and pour it into a bowl: the bowl is not full, so the bowl holds more. Fill the bowl and pour it back into the cup: it spills over. Then compare a tall thin bottle and a short wide bowl by pouring.
Say: "I fill one and pour it into the other. If it spills over, the first one holds more."
- 3 **Try it together** (5 min) Small groups take turns pouring between two containers, say "The ____ holds more than the ____," and set them in a row: holds less, holds more.
- 4 **Practice** (10 min) Children circle the one that holds more on sheet 1 of Holds More, Holds Less and the one that holds less on sheet 2. Early finishers circle full, half full or empty on sheet 3.
- 5 **Exit ticket** (5 min) Read **Exit Ticket 11.6** aloud, one question at a time. Children answer, then circle a face as you read the "I can" line. The second question asks which holds less, the sink or the bowl: read "less" slowly.

Need help? Pour between a very small cup and a big bowl before containers that are close.

Ready for more? Sheet 3 of Holds More, Holds Less (full, half full or empty), or put three containers in order by pouring.

GET READY

- A tub of rice or water and a scoop
- Containers: a cup, a bowl, a jar, a tall thin bottle, a pitcher
- A tray or towel for spills

WORDS TO USE

holds more: more fits inside

holds less: less fits inside; it fills up first

full: it cannot hold any more

empty: nothing inside

ASK

- Which one holds more? How did you find out?
- What happened when you poured it back?
- Does a taller bottle always hold more?

WATCH FOR

Picks the taller container as holding more.

Pour to check: a short, wide bowl can hold more than a tall, thin bottle.

Circles the one that holds more when asked for less. Read the word with a finger under it: the one that holds less fills up first.

ON ANIMAL MATH

PRINTABLE **Holds More, Holds Less:** sheets 1-2, and sheet 3 for more

EXIT TICKET **Kindergarten Measurement Exit Tickets:** Exit Ticket 11.6

Measurement

Lesson 11.7: Put things in order

GOAL Children put three things in order by length, height, size or weight, comparing two at a time, and write 1, 2 and 3.
I can put three things in order.

About 35 minutes

★ Taught in Kindergarten in some states

THE LESSON

- 1 Warm up** (5 min) Three children of different heights stand back to back. The class tells who is tallest and who is shortest, then puts them in order.
- 2 Teach** (10 min) Build cube towers of 2, 6 and 4. Find the shortest and put card 1 by it, then the tallest gets 3, and the one left gets 2. Do it again with three toy animals of one kind: smallest, middle, biggest.
Say: "First the smallest, then the biggest. The one left goes in the middle."
- 3 Try it together** (5 min) Pairs order a bag of three things, put cards 1, 2 and 3 beside them and trade bags. One bag is ordered by weight, two at a time on the balance.
- 4 Practice** (10 min) Children write 1, 2 and 3 from smallest to biggest on sheet 5 of Big and Small Animals, then from shortest to longest on the top half of sheet 2 of Comparing and Ordering Lengths.
- 5 Exit ticket** (5 min) Read **Exit Ticket 11.7** aloud, one question at a time. Children answer, then circle a face as you read the "I can" line. Both questions put 1 under the smallest or the shortest: a child who writes 1 under the biggest ordered them the other way.

Need help? Order three cube towers that are very different (2, 5 and 9 cubes) before things that are close.

Ready for more? Order four to six things, such as the table's pencils, or order by how much things hold on sheet 5 of Holds More, Holds Less.

GET READY

- Bags of three things to order (three ribbons, three toy animals of one kind)
- Cards that say 1, 2 and 3
- Masking tape for a start line

WORDS TO USE

smallest: smaller than all the others

tallest: taller than all the others

order: one after another, from small to big

middle: the one in between

ASK

- Which one did you find first? Why?
- Why does this one go in the middle?
- Which is the tallest? How do you know?

WATCH FOR

Writes 1 under the biggest. Read the direction with a finger under it: 1 goes with the smallest.

Puts the middle one first or last. Compare two at a time: bigger than this one, smaller than that one, so it goes between.

Orders lengths by the right ends when the left ends are not lined up. Line up the ends at the start line first.

ON ANIMAL MATH

- PRINTABLE** **Big and Small Animals: Comparing Size:** sheet 5
- PRINTABLE** **Comparing and Ordering Lengths:** sheet 2, the top half (shortest to longest)
- PRINTABLE** **Holds More, Holds Less:** sheet 5, for more
- PRINTABLE** **Fall Measuring:** sheet 4 (count the acorns, then order), for more
- EXIT TICKET** **Kindergarten Measurement Exit Tickets:** Exit Ticket 11.7

Measurement

Lesson 11.8: Measure with cubes

GOAL Children measure a length with cubes laid end to end from the start line, touching, with no gaps and none on top, and count how many cubes long it is.

I can measure with cubes that touch, with no gaps.

About 35 minutes

★ Taught in Kindergarten in some states

THE LESSON

- 1 Warm up** (5 min) Children sit shoulder to shoulder along one side of the rug. How many children long is the rug? Count together.
- 2 Teach** (10 min) Lay a crayon at the start line. Put cubes beside it from the line, touching, until they reach its other end, and count them. Then show three wrong ways: gaps between the cubes, a cube on top of another, and starting past the line. Fix each one together.
Say: "I start at the line. The cubes touch, with no gaps and none on top. I count them: the crayon is 5 cubes long."
- 3 Try it together** (5 min) Partners measure things from the tub with cubes and say "The ____ is ____ cubes long." The partner checks the start line and the gaps.
- 4 Practice** (10 min) Children cut out the cubes and measure on sheet 3 of Cut and Measure, then the ladybugs on sheet 1 (its top shows touching, gaps and on top). Early finishers measure with paper clips on sheet 2.
- 5 Exit ticket** (5 min) Read **Exit Ticket 11.8** aloud, one question at a time. Children answer, then circle a face as you read the "I can" line. The second question shows one ribbon with touching cubes and one with gaps: the one with gaps reaches the end with fewer cubes.

Need help? Measure with a train of snapped cubes laid on the start line before using loose cubes.

Ready for more? Make a worm with buttons and compare on sheet 5 of Cut and Measure, or play the Cubes and Clips level of the Measuring Length quiz with an adult beside them.

GET READY

- Linking cubes, all one size, for each child
- Things to measure: crayons, pencils, spoons, paper strips
- Masking tape for a start line on each table

WORDS TO USE

cubes long: how many cubes fit from one end to the other

touching: each cube right next to the one before

gap: an empty space between two cubes

ASK

- Where did you start? Why there?
- Are there any gaps? How do you know?
- How many cubes long is it?

WATCH FOR

Leaves gaps between the cubes. Snap the cubes into a train, then lay the train beside the thing.

Starts past the start line. Put the first cube right on the line, touching the end of the thing.

Counts a cube twice or skips one. Touch each cube as you count it, or push each one up a little as it is counted.

ON ANIMAL MATH

PRINTABLE

Cut and Measure with Nonstandard Units: sheets 1-3, and sheet 5 for more

TOOL

Measuring Tool: Measure With Cubes; turn off Snap Units Together to show gaps

QUIZ

Measuring Length Quiz: the Cubes and Clips level

EXIT TICKET

Kindergarten Measurement Exit Tickets: Exit Ticket 11.8

Measurement

Lesson 11.9: Blocks and cups

GOAL Children measure how heavy a thing is by counting the blocks that balance it, and how much a container holds by counting the cups of rice or water that fill it.

I can count the blocks or cups that measure a thing.

About 35 minutes

★ Taught in Kindergarten in some states

THE LESSON

- 1 Warm up** (5 min) Children stand like a balance with their arms out. Call “heavy on this side”: that arm drops. Then make both arms level.
- 2 Teach** (10 min) Put an apple on one pan. Add blocks to the other pan one at a time, counting, until the balance is level: the apple weighs the same as 6 blocks. Then fill a bowl with cups of rice, counting each cup, until it is full.
Say: “When the balance is level, the two sides weigh the same. I count the blocks. I count the cups that fill the bowl.”
- 3 Try it together** (5 min) Groups take turns at two stations: weigh a toy with blocks, and fill a jar with cups of rice. They say “The toy weighs the same as ____ blocks” and “The jar holds ____ cups.”
- 4 Practice** (10 min) Children count the blocks on each level balance on sheet 4 of Heavier or Lighter?, then the cups that fill each container on sheet 4 of Holds More, Holds Less.
- 5 Exit ticket** (5 min) Read **Exit Ticket 11.9** aloud, one question at a time. Children answer, then circle a face as you read the “I can” line. The pot takes 8 cups, drawn in rows of three: watch for a child who counts a row twice.

Need help? Weigh light things that balance 2 to 5 blocks first.

Ready for more? Sheet 5 of Heavier or Lighter?: read each sentence aloud and circle true or false.

GET READY

- A pan balance and a tub of same-size blocks or cubes
- Things to weigh: an apple, a toy, a shoe
- A small cup, rice or water, and a bowl, a jar and a pitcher to fill

WORDS TO USE

level: flat, not tipping either way: both sides weigh the same

fill: pour in until it is full

ASK

- Is the balance level? How can you tell?
- How many blocks weigh the same as the apple?
- How many cups filled the jar?

WATCH FOR

Counts the blocks before the balance is level.

Stop and look: level means flat. Add or take away one block at a time.

Pours cups that are not full. Fill each cup to the top and level it with a finger before pouring.

Loses count of the cups poured. Drop a counter in a dish for each cup poured, then count the counters.

ON ANIMAL MATH

PRINTABLE

Heavier or Lighter? sheet 4, and sheet 5 (true or false, read aloud) for more

PRINTABLE

Holds More, Holds Less: sheet 4

EXIT TICKET

Kindergarten Measurement Exit Tickets: Exit Ticket 11.9