
Six math clues · answer key

How a Bike Chain Works

Grade 2 math. Join the amounts for addition or find what remains for subtraction. Each story takes one step.

Math 1 · 45

$28 + 17 = 45$ links. Add 10 to get 38, then add 7.

Math 2 · 38

$64 - 26 = 38$ beads. Subtract 20 to get 44, then subtract 6.

Math 3 · 42

$23 + 19 = 42$ turns. Add 20 to get 43, then take back 1.

Math 4 · 34

$52 - 18 = 34$ teeth. Subtract 10 to get 42, then subtract 8.

Math 5 · 48

$32 + 16 = 48$ teeth. Add 10 to get 42, then add 6.

Math 6 · 8

$15 - 7 = 8$ laps. Count from 7 up to 15 to find the difference.

Grade 2 math. Six one-step addition and subtraction stories stay within 100. Quantities are supplied in the questions; there is no need to count painted details.

Reading & writing · answer key

How a Bike Chain Works

Reading · 1

The rigid links turn at joints joined by tiny pins. The chain bends at those joints instead of stretching like rubber.

Reading · 2

The pedal turns the front sprocket. Its teeth pull the chain, which pulls the back sprocket's teeth and turns the back wheel.

Reading · 3

One front turn moves the chain past 32 teeth. That is two groups of 16, so the back sprocket and wheel turn twice.

Writing

A spoken, dictated, drawn, or written command counts. Example: "Count the teeth on the big sprocket, then draw the chain hugging it."

Keep Big beside you. Count only while the bike is still. Big holds an upside-down bike steady on a mat; turn only the pedal slowly by hand, with fingers well away from chain, sprockets, and spokes whenever anything moves. Leave oiling and repairs to Big. Oil helps the joints bend smoothly. Links do not stretch like elastic during ordinary pedaling; wear at pins and bushings can lengthen a chain over time. The diorama shows a single chainring and rear sprocket with a fixed 32-to-16 tooth ratio. It isolates forward pedaling, when the rear freewheel engages; coasting lets a wheel continue without turning the pedals. The top run carries the greater pulling tension. The lower run returns the chain. A bead loop needs matching notches to engage a cardboard model; a smooth string can show the path but may slip. A smaller front-to-back tooth ratio gives more turning force at the wheel for the same pedal effort, at the cost of fewer wheel turns. Helmet on for a ride beside Big.

Accept speech, dictation, drawing, or writing. One clear command is plenty. Example: "Count the teeth on the big sprocket, then draw the chain hugging it."

Four stops along the chain

How a Bike Chain Works

Quiz 1. Why can a bike chain bend around a sprocket?

Tiny pins join the links and let neighboring links turn at their joints.

Quiz 2. What does the front sprocket do as you pedal forward?

The front sprocket's teeth pull the chain. The chain then pulls the back sprocket's teeth.

Quiz 3. With 32 teeth in front and 16 behind, how many back-wheel turns come from one pedal turn?

The back wheel turns twice: 32 front teeth move the chain past two groups of 16 back teeth.

Quiz 4. Which sprocket pair makes pedaling easier uphill?

A small front sprocket and a big back sprocket make pedaling easier uphill, with fewer wheel turns per pedal turn.

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