

Six math clues · answer key

How Drill Bits Work

Age 8 / Grade 2 math. Decide whether the story joins groups or takes some away. Each problem needs one addition or subtraction. Welcome a drawing or spoken explanation.

Math 1 · 41

$24 + 17 = 41$ screws. Add $20 + 10$ and $4 + 7$, then combine $30 + 11$.

Math 2 · 35

$63 - 28 = 35$ screws. Take away 20 to get 43, then take away 8.

Math 3 · 43

$16 + 27 = 43$ turns. Add $10 + 20$ and $6 + 7$, then combine $30 + 13$.

Math 4 · 32

$54 - 22 = 32$ curls. Take away 20 to get 34, then take away 2.

Math 5 · 53

$38 + 15 = 53$ turns. Add 10 to get 48, then add 5.

Math 6 · 37

$71 - 34 = 37$ scoops. Take away 30 to get 41, then take away 4.

Age 8 / Grade 2 math. Six one-step story problems within 100, with addition and subtraction. Story quantities are supplied numbers, not counts to infer from the pictures.

Reading & writing · answer key

How Drill Bits Work

Reading · 1

Cutting lips shave off chips, and flutes carry the chips out. Removing chips leaves space for more material to be shaved.

Reading · 2

A screw thread is a raised spiral ridge that helps the screw move in. A flute is a spiral groove that gives chips a way out.

Reading · 3

Both use a turning spiral to carry material along: an auger lifts loose soil or ice, and an Archimedes screw lifts water.

Writing

Accept a clear command spoken, dictated, drawn, or written. Example: "Turn the screw slowly into the soap, then look at the curls on the thread."

Age 8, Grade 3 reading, Grade 2 math. Power drills are grown-up tools; kids do not use them. A grown-up stays close and leads the soap or clay activity, placing the material on a tray and choosing the screw. Use an enclosed hand pencil sharpener for the pencil-curl observation. The illustrated drill bit is a common twist bit. Its cutting lips remove material; flutes provide chip clearance as the bit rotates and advances. The diorama isolates chip travel in a fixed cutaway, with enlarged chips and a shortened path. Real chip shapes and motion depend on the material and bit. Screw threads are raised ridges, unlike the recessed flutes. A turning spiral needs contact or confinement to move material along. The egg beater uses gears for faster rotation; it does not lift material like an auger.

Welcome speech, dictation, invented spelling, or writing. One command is enough. Example: "Turn the screw slowly into the soap, then look at the curls on the thread."

Four turning clues

How Drill Bits Work

Quiz 1. Which part of a twist drill bit shaves off material?

The cutting lips at the tip shave off material as the drill bit turns.

Quiz 2. What job do the flutes do?

Flutes are spiral grooves that carry chips up and out of the hole.

Quiz 3. What is a screw thread?

A screw thread is a spiral ridge that helps a turning screw move into material.

Quiz 4. What can an Archimedes screw lift?

An Archimedes screw lifts pockets of water as its spiral turns inside a sloping tube.

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