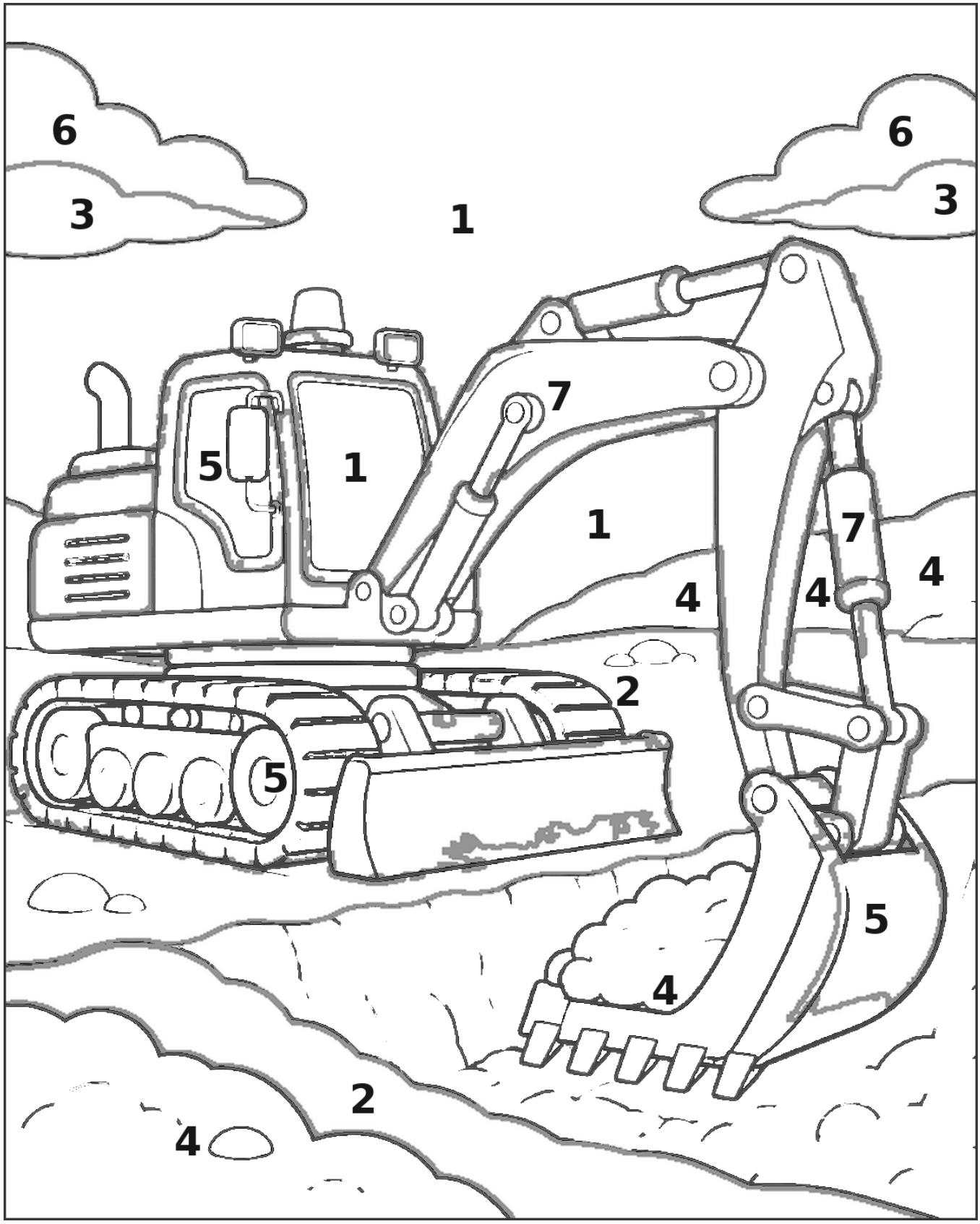
Trench Excavator

How does an excavator move its bucket?



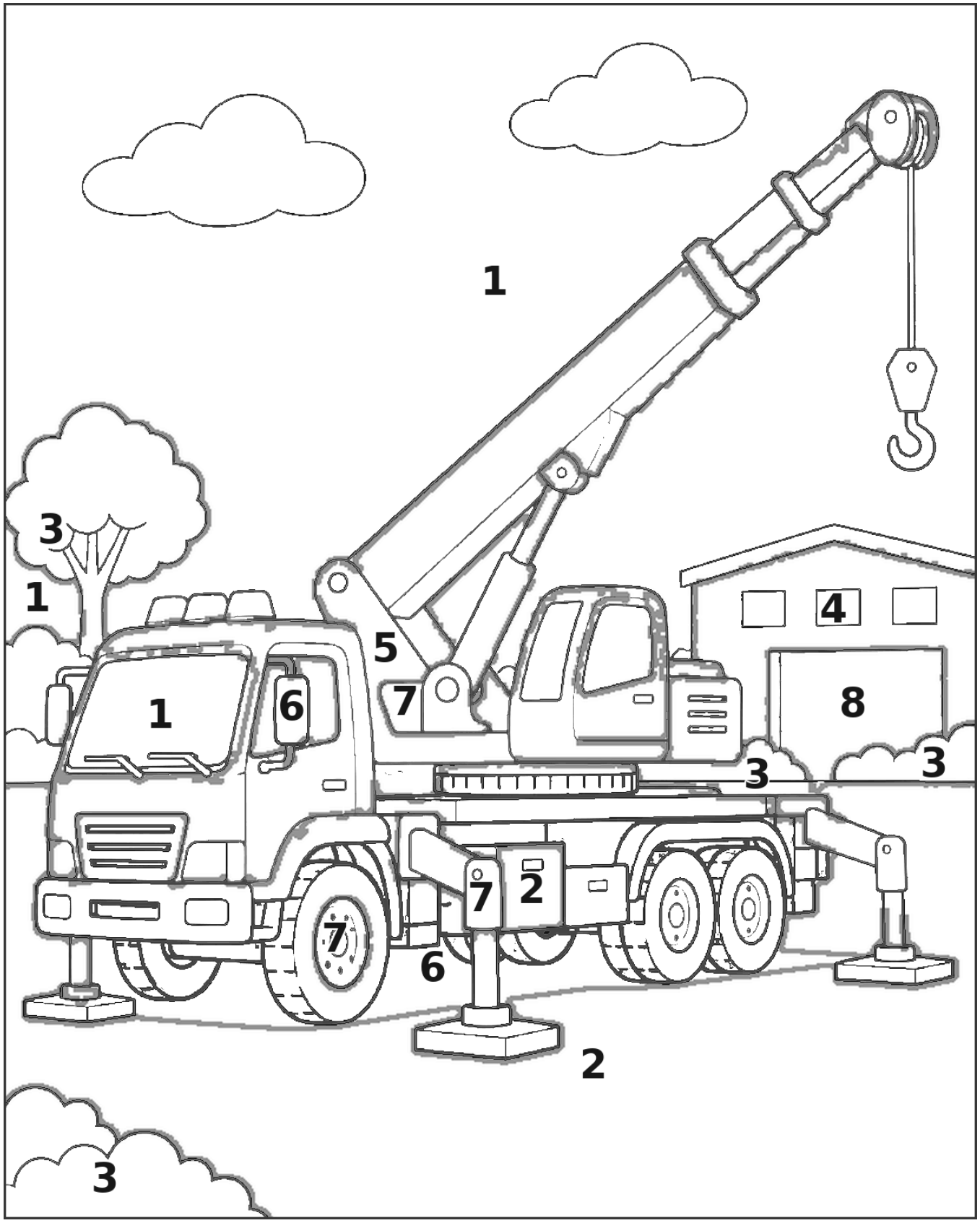


1 Sky
2 Butter
3 Lilac
4 Rust
5 Slate
6 Parchment
7 Gold

Did you know? The large boom moves the arm up and down. The stick reaches farther into the trench and the bucket curls to gather soil. Hydraulic cylinders move these connected pieces by pushing oil under pressure.

Mobile Crane

Why does a crane put feet on the ground?

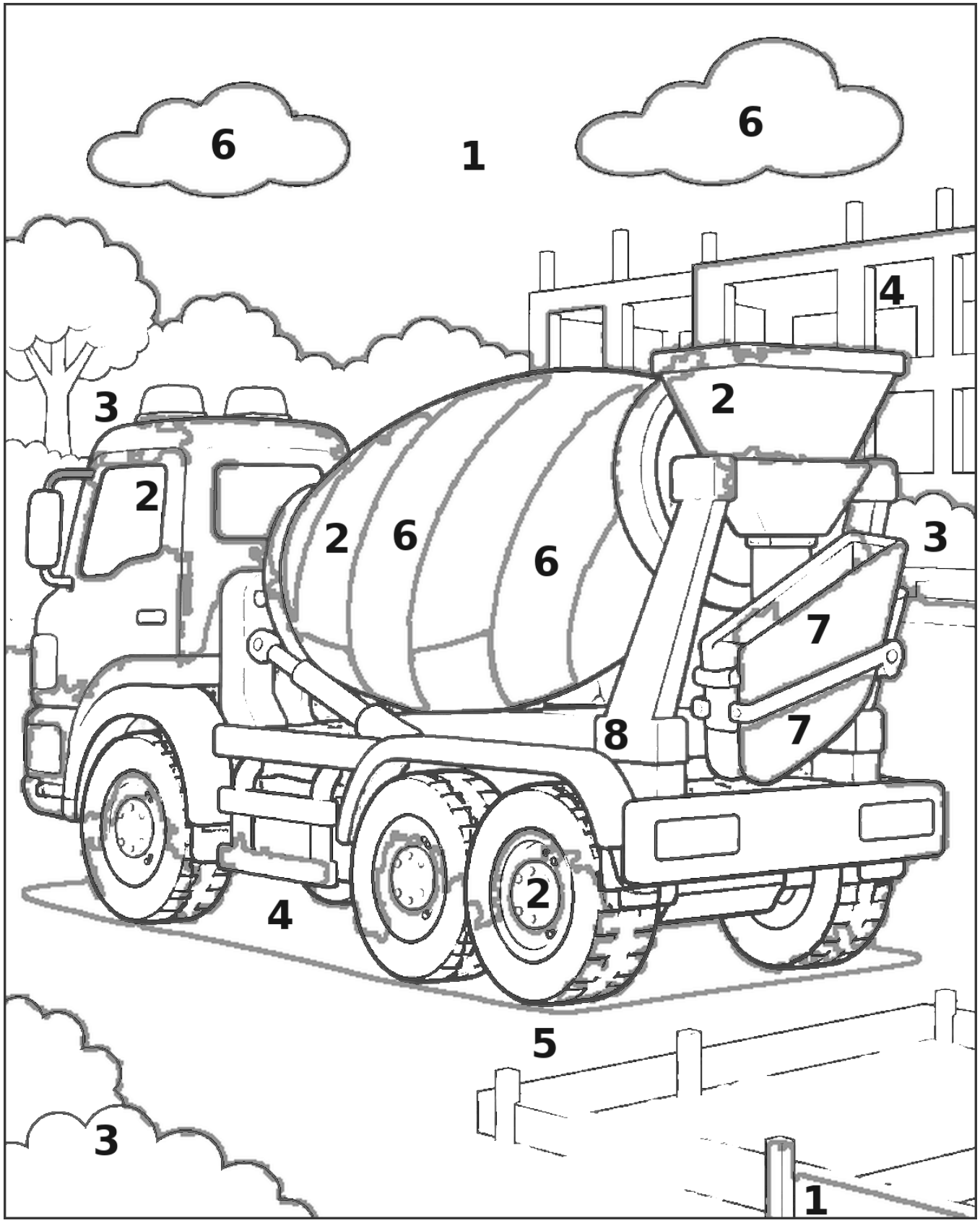


1 Sky
2 Periwinkle
3 Moss
4 Cream
5 Dusk
6 Plum
7 Gold
8 Lagoon

Did you know? A mobile crane can extend supports called outriggers. Pads at their ends spread the load onto the ground and widen the machine's support. The long boom can then reach beyond that base during a lift.

Concrete Mixer

Why does the drum turn while the truck travels?

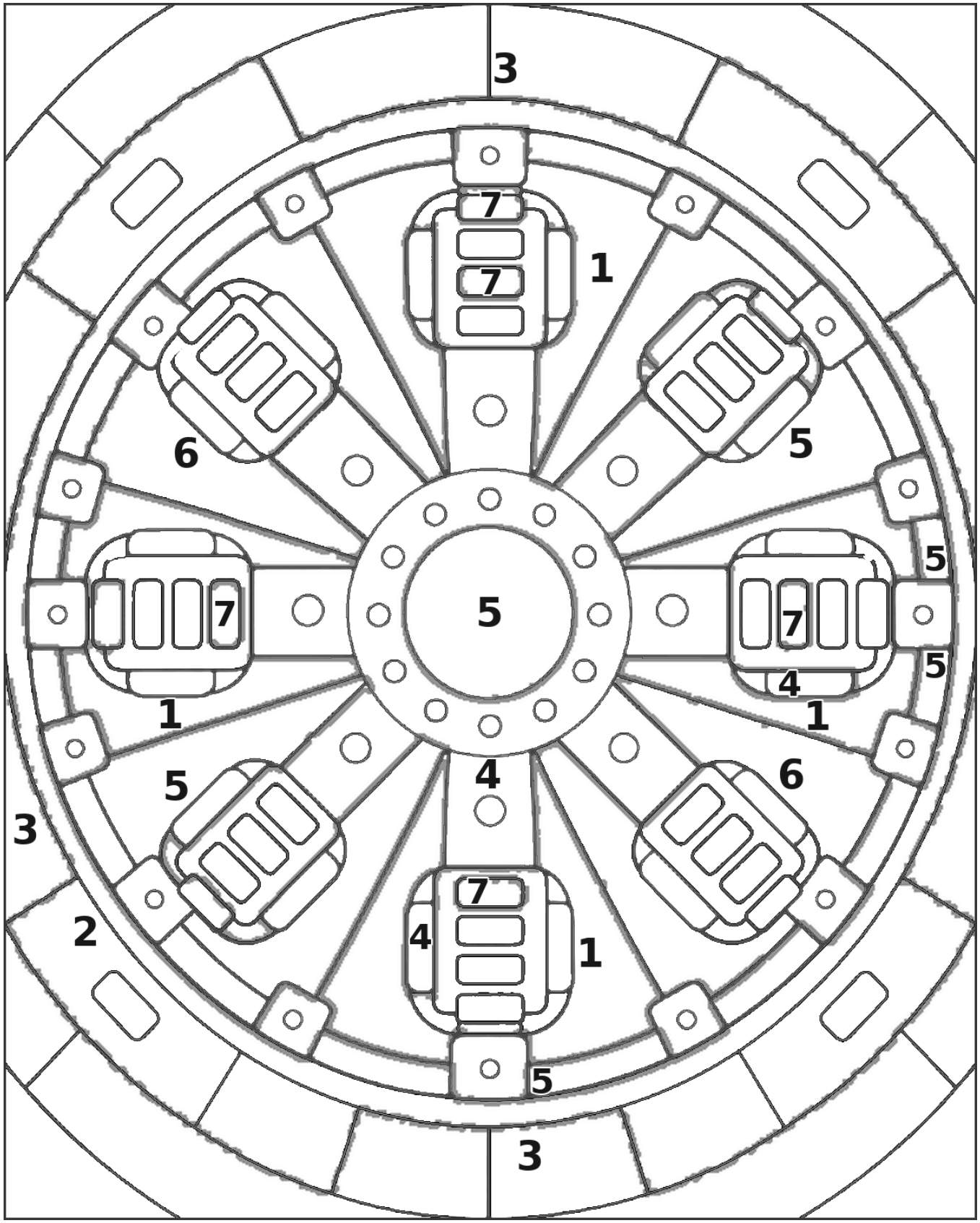


1 Butter
2 Lagoon
3 Moss
4 Chestnut
5 Honey
6 Parchment
7 Pearl
8 Teal

Did you know? Turning the drum keeps fresh concrete moving together on the way to the site. Blades inside the drum help mix and move it. When it is time to unload, the concrete can flow from the back into the chute.

Tunnel Borer

How can a machine cut a round tunnel?



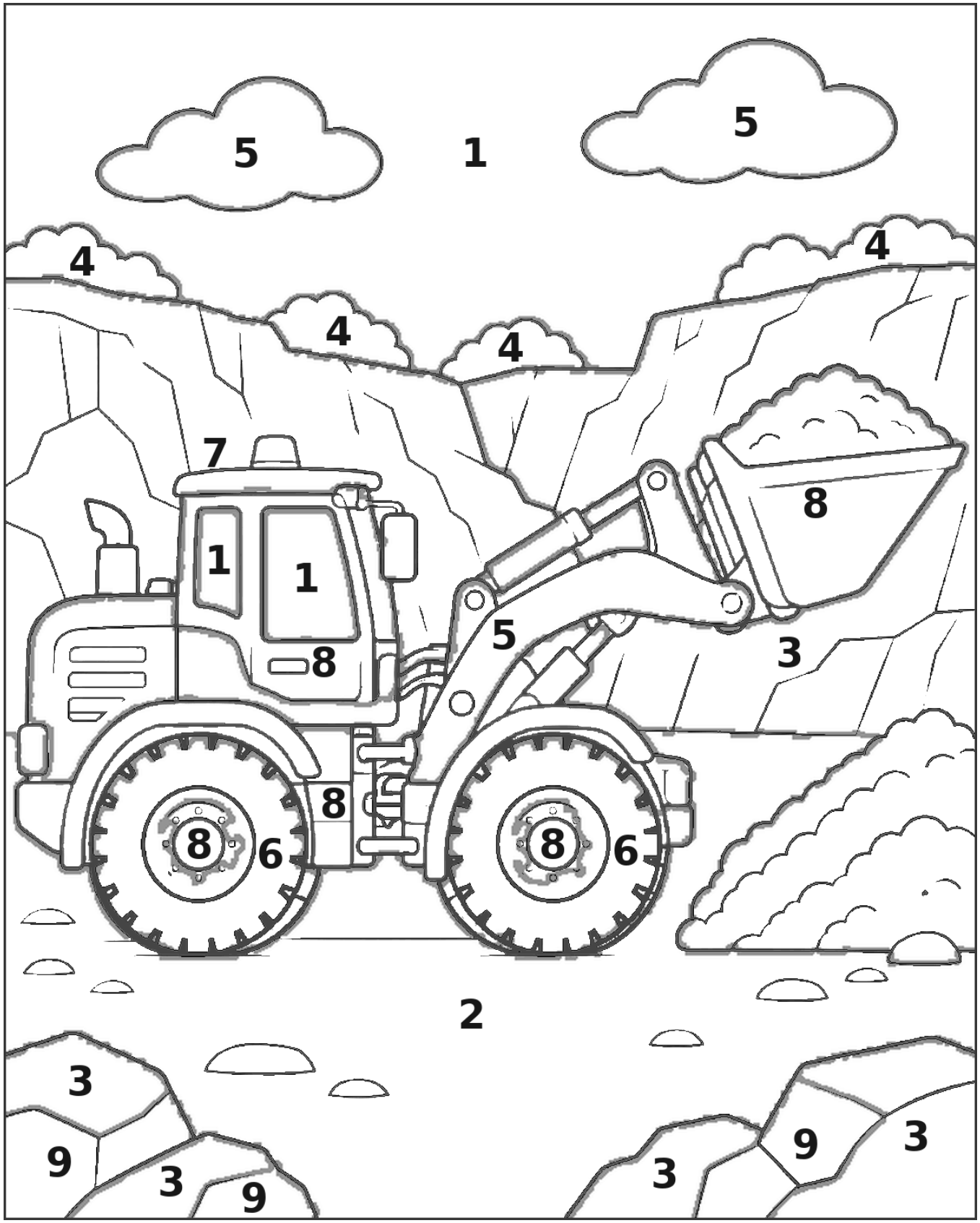
1 Turquoise
2 Sand
3 Lavender
4 Yellow
5 Orange
6 Slate blue
7 Silver

Did you know? A round cutterhead turns at the front of the tunnel boring machine. Its tools break up the ground as the machine advances. Behind the cutterhead, curved lining pieces can be joined into rings to support the tunnel.

Wheel Loader

How does a wheel loader move a heap of gravel?



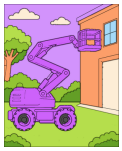


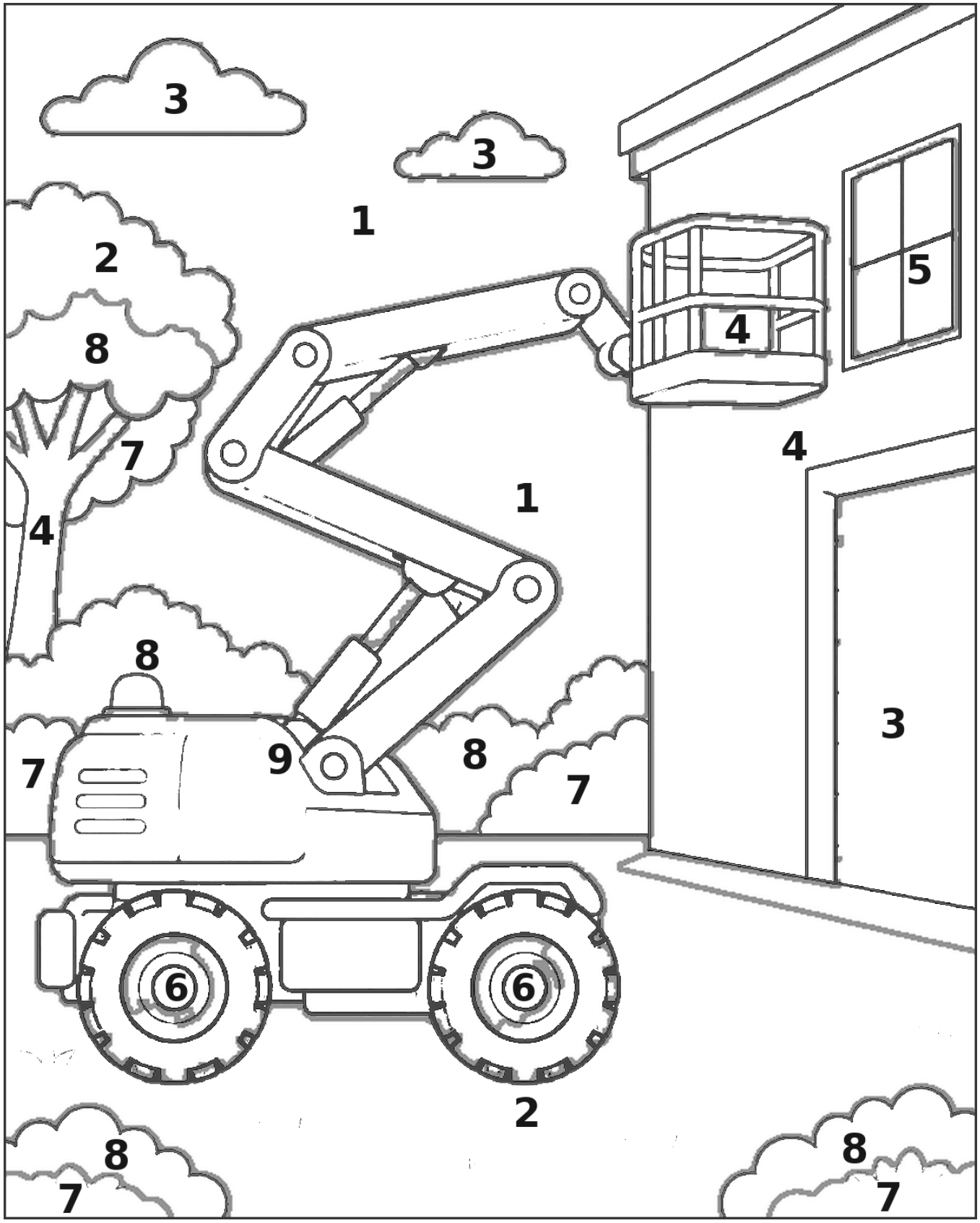
1 Sky
2 Peach
3 Periwinkle
4 Moss
5 Snow
6 Plum
7 Honey
8 Lagoon
9 Mauve

Did you know? A wheel loader scoops loose material into its front bucket. The lift arms raise the bucket, and the bucket can tip forward to empty it. A larger bucket can move more light material in one trip.

Boom Lift

How does a lift reach over an obstacle?



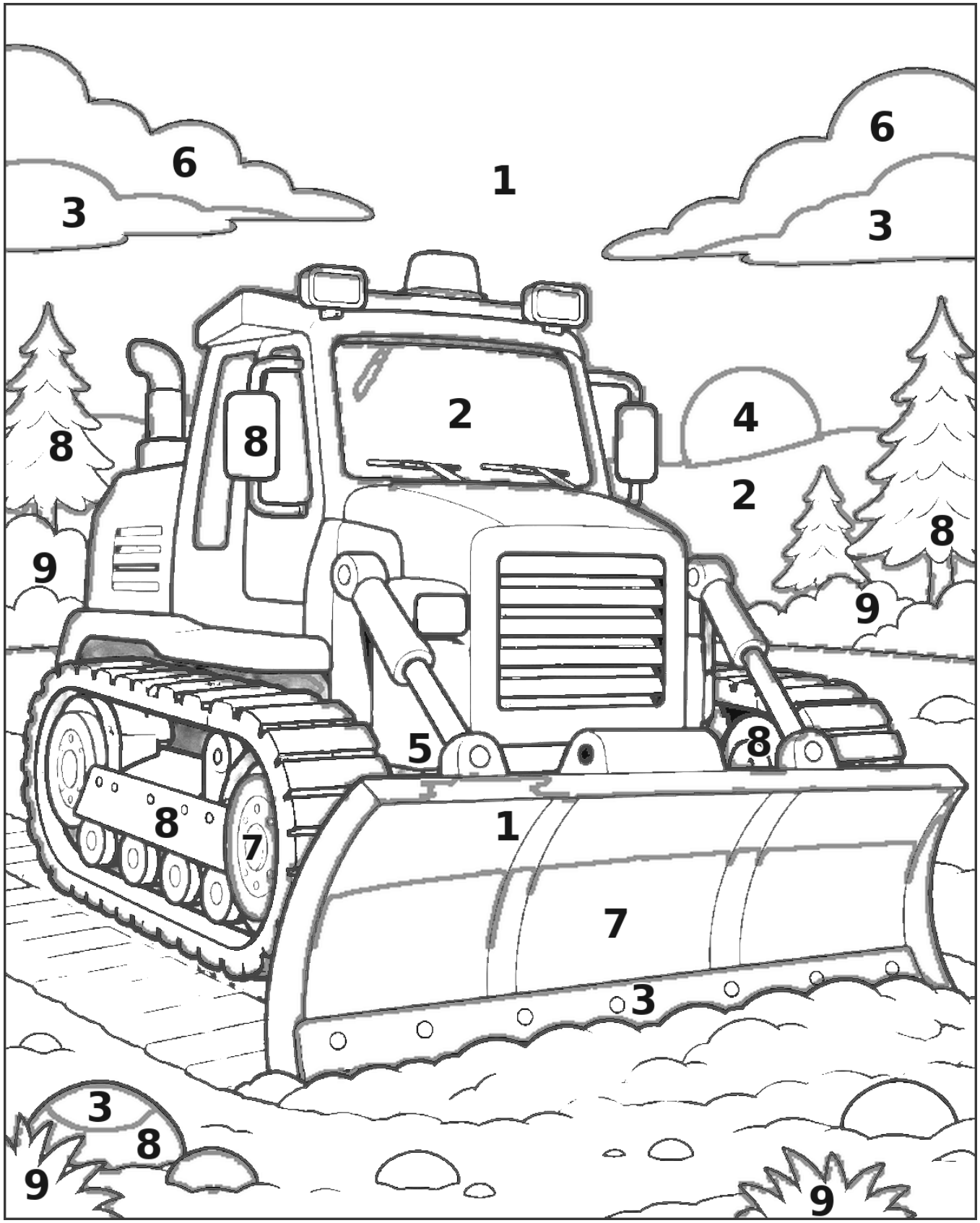


1 Lilac	**2 Sage**	**3 Parchment**
4 Apricot	**5 Sky**	**6 Walnut**
7 Meadow	**8 Moss**	**9 Rose**

Did you know? The boom has joints that let one section swing over a barrier while another points up. That arrangement can put the platform beside a wall without moving the whole machine right against it. Look for the elbow in the boom.

Bulldozer

Why does a bulldozer have a wide blade?

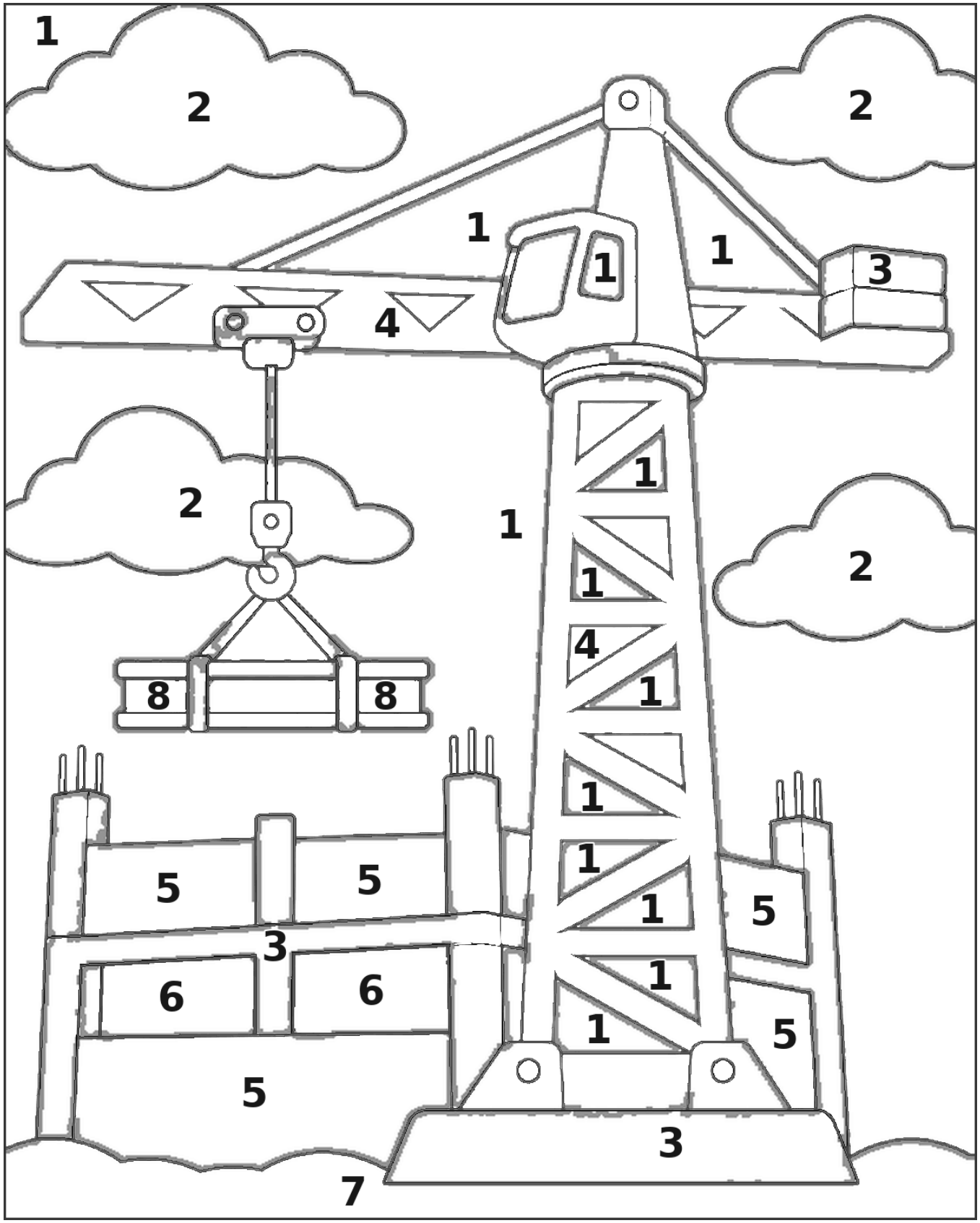


1 Gold
2 Sky
3 Lilac
4 Ivory
5 Copper
6 Parchment
7 Butter
8 Plum
9 Moss

Did you know? A wide blade can push and spread soil across an area as the bulldozer moves. Different blades can carry different amounts of loose material. Look for the parts that connect the blade to the tracked machine.

Tower Crane

What moves the hook along a tower crane's arm?

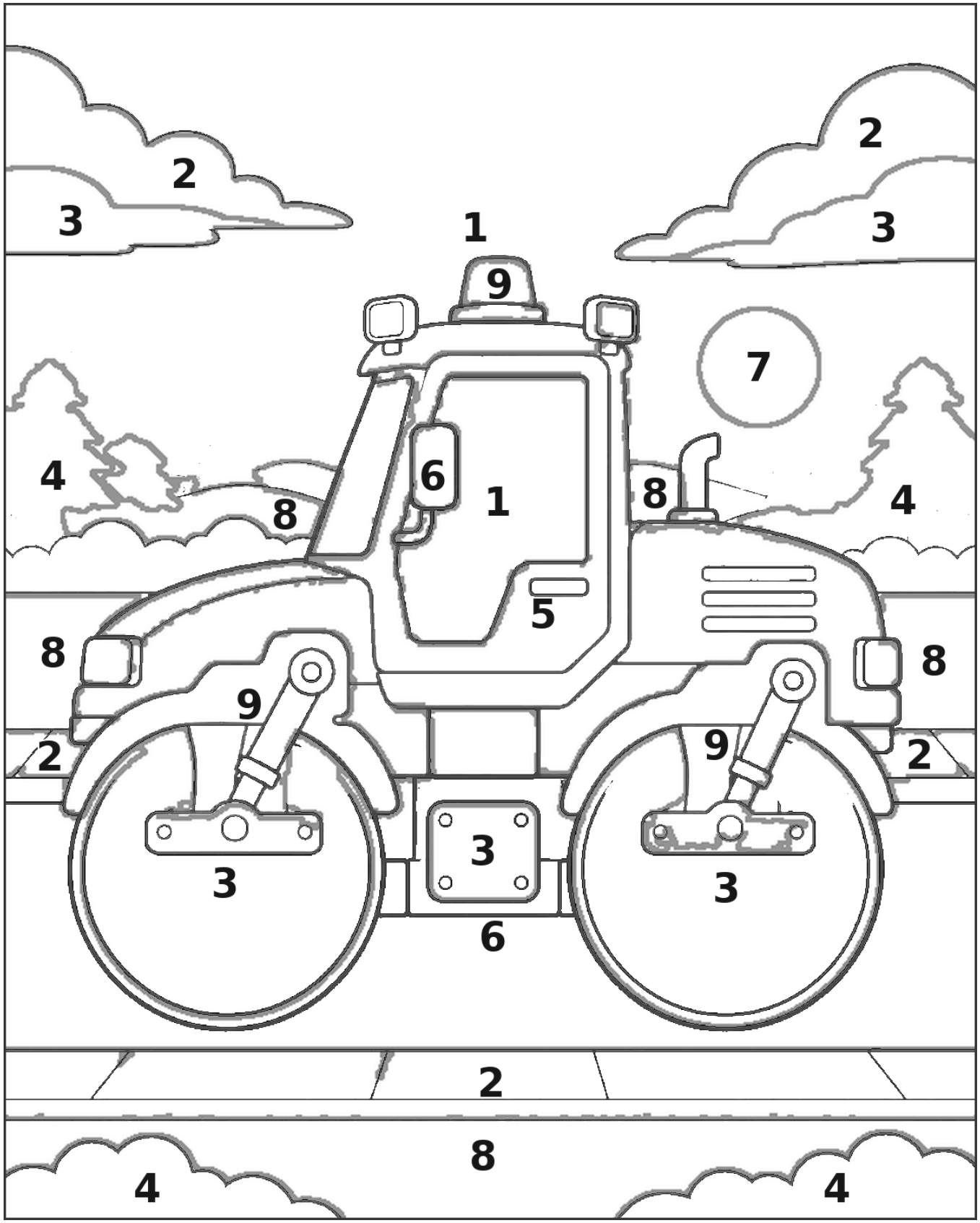


1 Sky
2 Snow
3 Lilac
4 Ivory
5 Copper
6 Denim
7 Rust
8 Ink blue

Did you know? On a horizontal-jib tower crane, a trolley travels along the long arm. The lifting line runs through it to the hook below. Moving the trolley changes how far from the tower the hook can reach.

Road Roller

Why does a road roller have smooth steel drums?

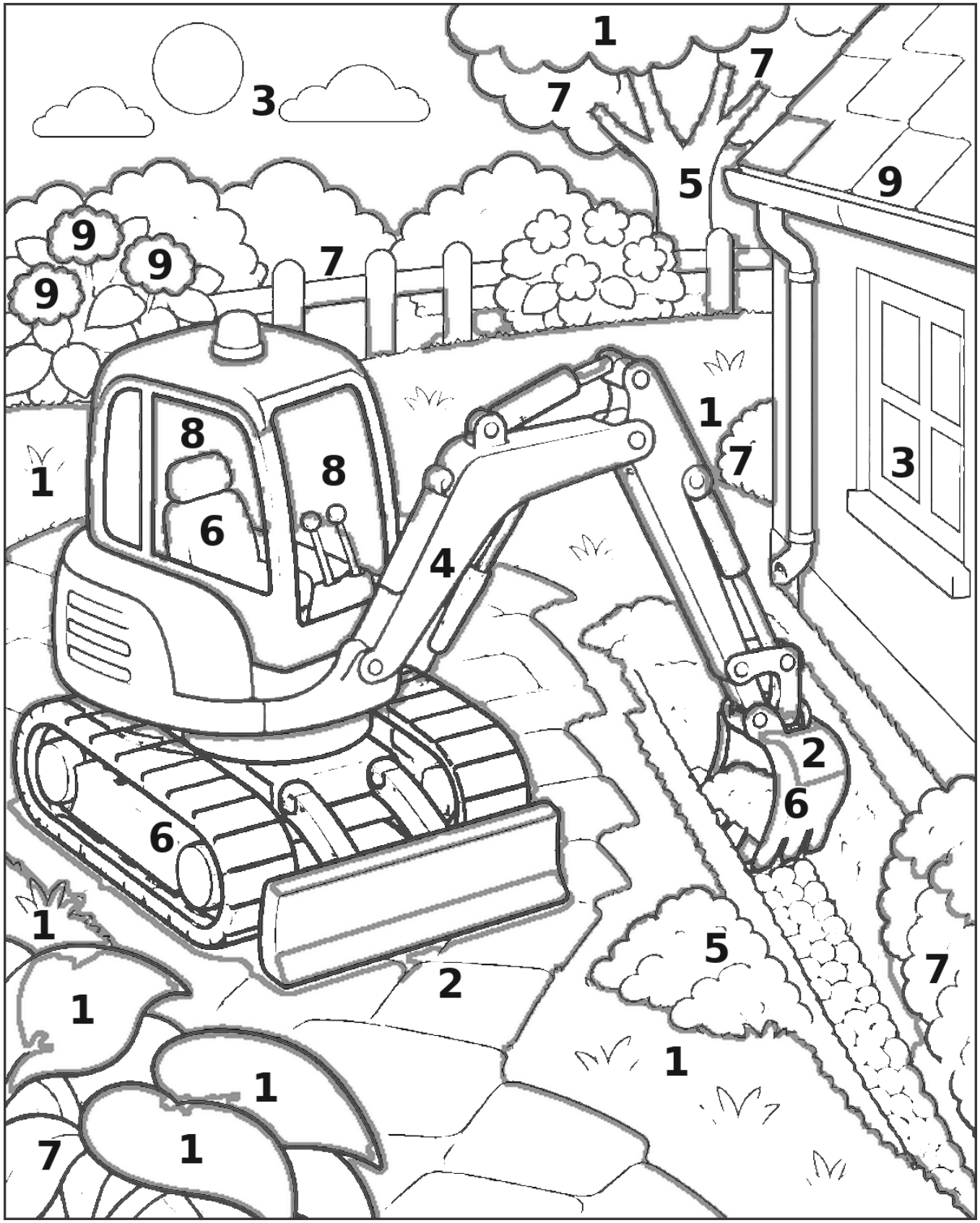


1 Sky
2 Pearl
3 Lilac
4 Moss
5 Dusk
6 Charcoal
7 Ivory
8 Sage
9 Gold

Did you know? The wide drums press on the new surface as they roll. This helps compact the asphalt and squeeze out air spaces. A smooth drum leaves a smooth surface, ready for the next stage of the roadwork.

Mini Excavator

What makes a compact excavator fit in a tight space?

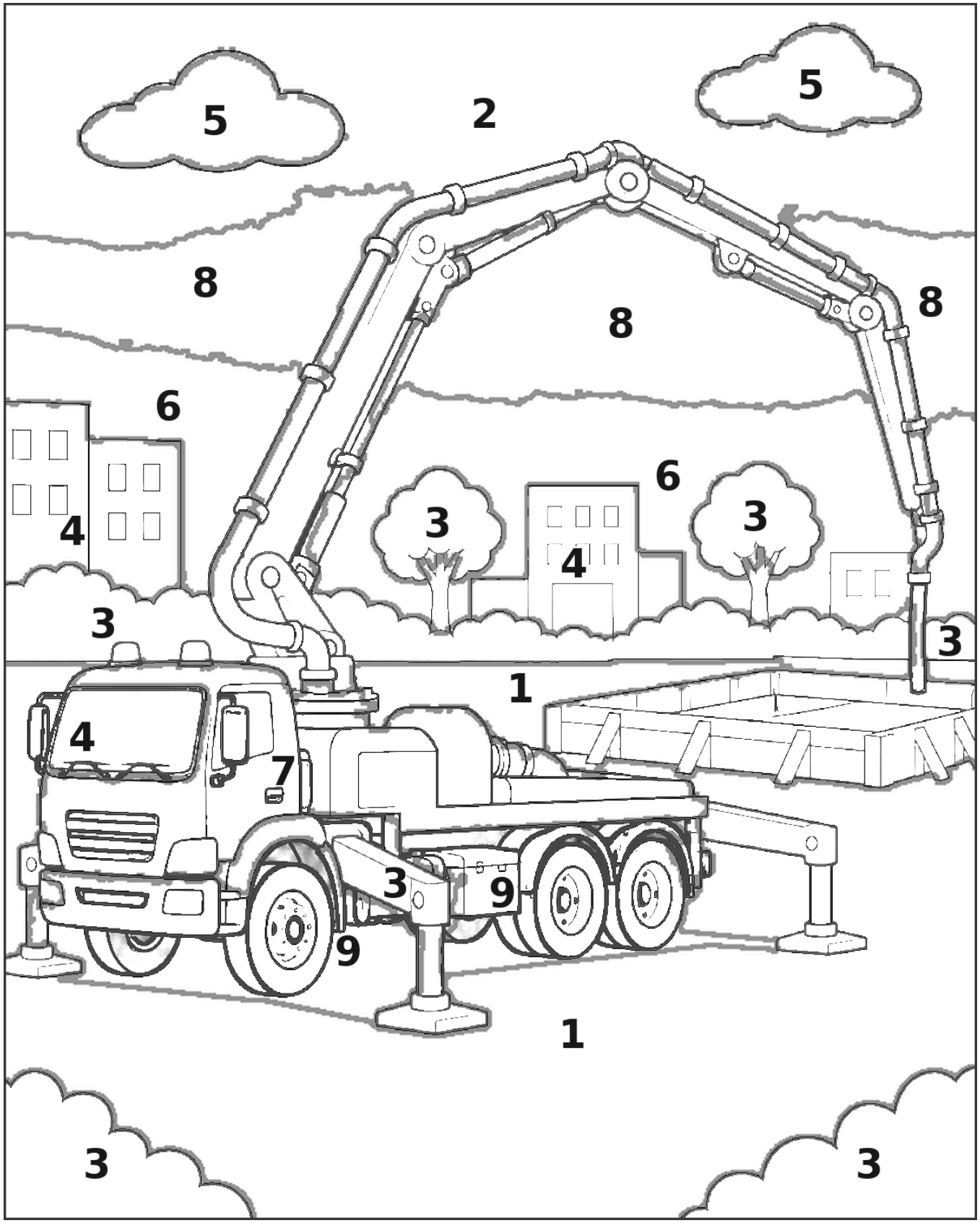


1 Sage
2 Mauve
3 Butter
4 Lagoon
5 Chestnut
6 Plum
7 Meadow
8 Sky
9 Honey

Did you know? The short body takes up less room around the machine as its upper part turns. A narrow undercarriage can help it move through gaps. It can still dig with a boom, a stick and a bucket, just like a big excavator.

Concrete Pump

How does fresh concrete reach a spot far from the truck?



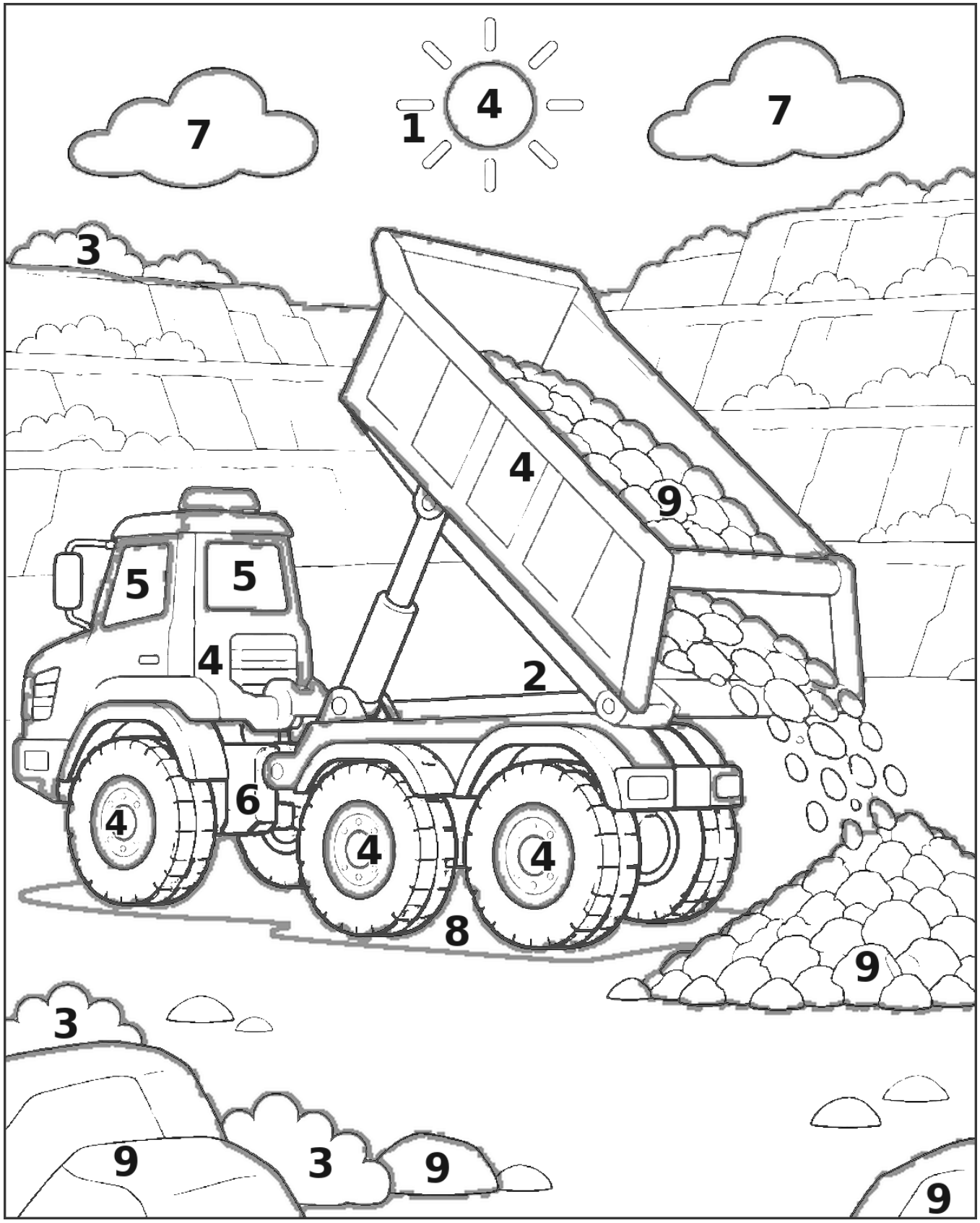
1 Mauve
2 Blush
3 Sage
4 Sky
5 Lilac
6 Butter
7 Snow
8 Peach
9 Plum

Did you know? A pump pushes fresh concrete through a pipe along the jointed arm. The arm reaches across the site so the outlet can deliver concrete where it is needed. The truck can stay in one place while the arm moves.

Site Dumper

Why can the dump truck bend in the middle?



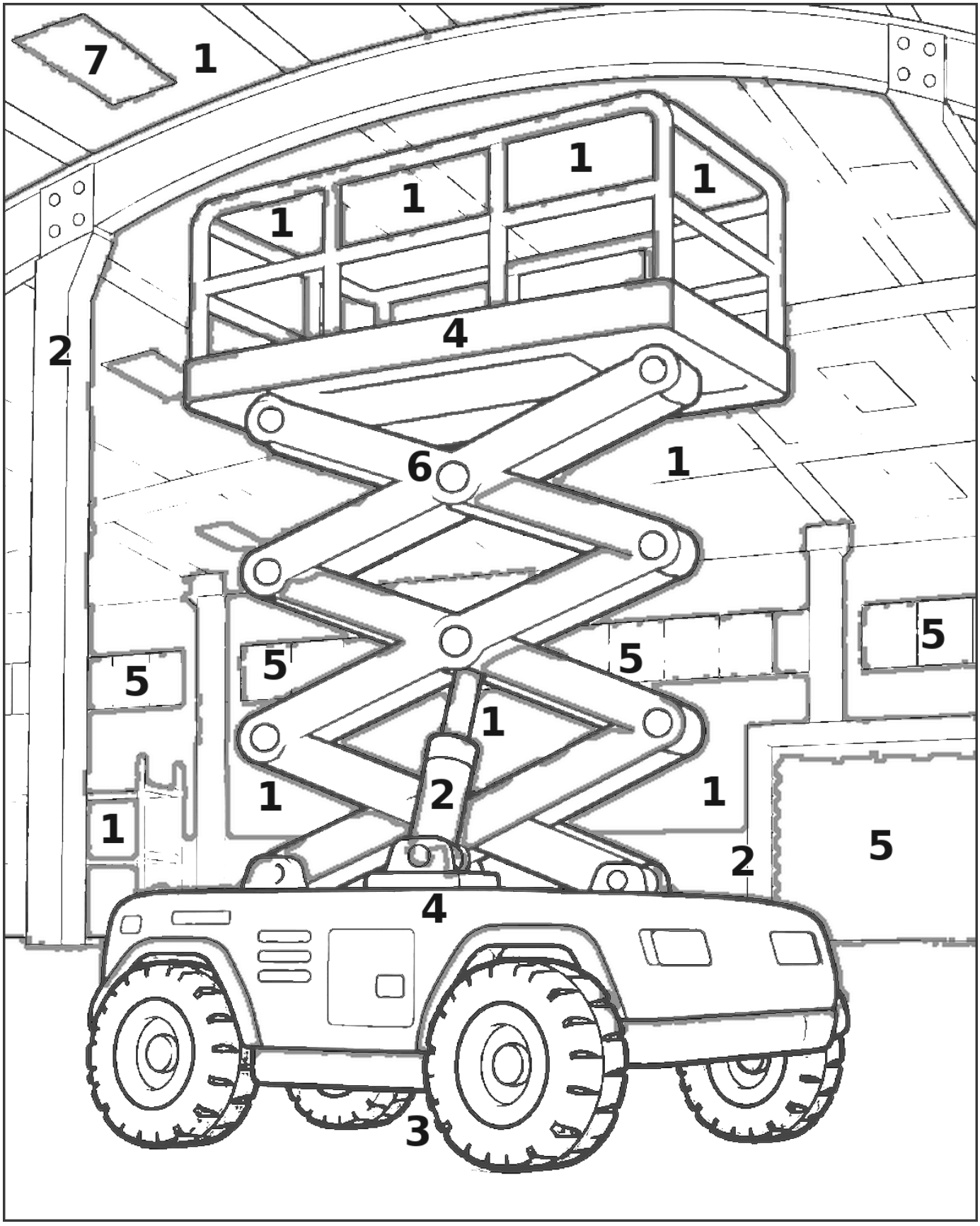


1 Lilac
2 Peach
3 Moss
4 Gold
5 Sky
6 Plum
7 Mauve
8 Chestnut
9 Periwinkle

Did you know? An articulated dump truck has a joint between its front cab and rear load section. The sections can turn at that joint, which helps the truck steer on rough ground. A separate cylinder raises the dump bed to unload it.

Scissor Lift

Why do the arms look like scissors?

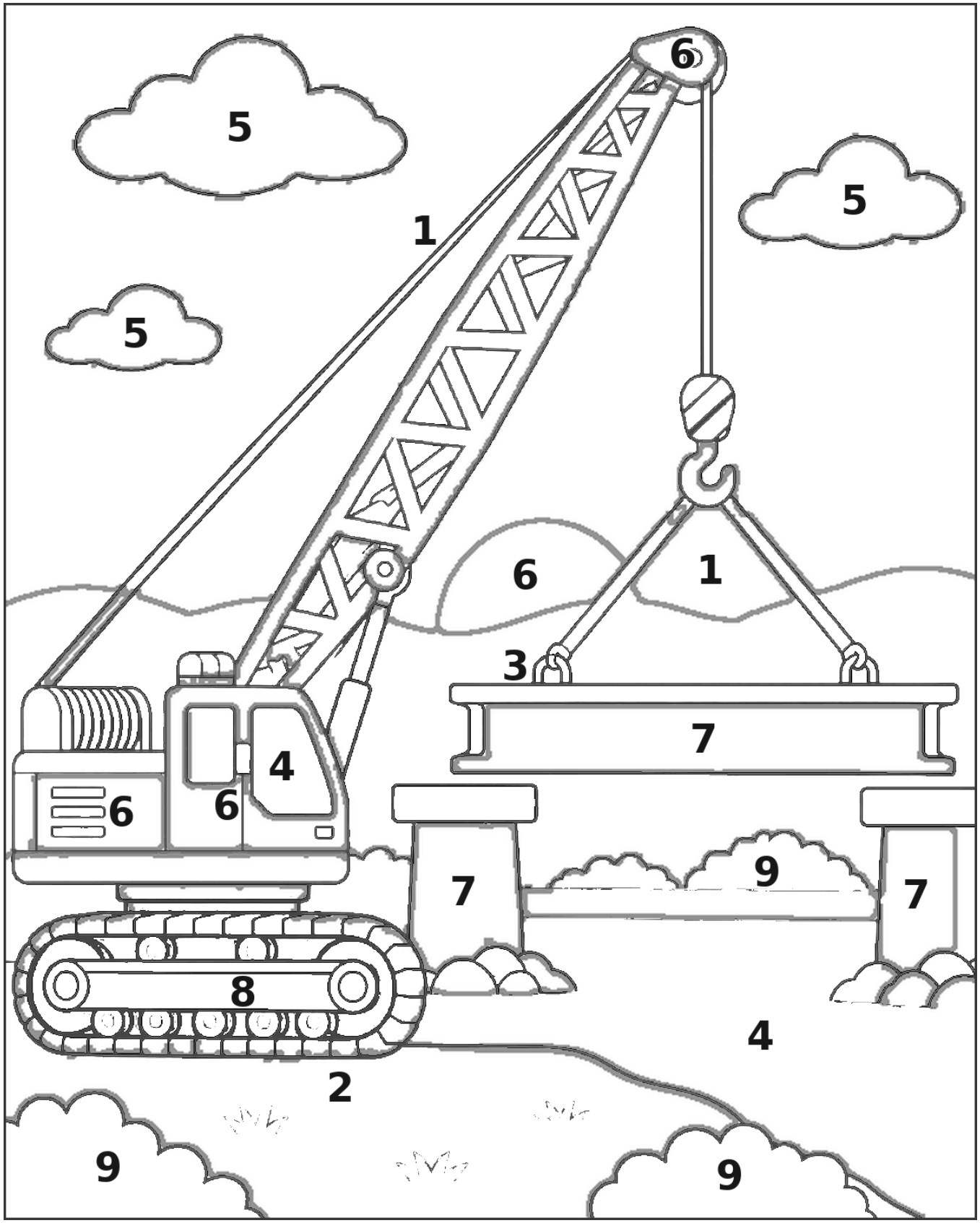


1 Butter
2 Lagoon
3 Ash
4 Sage
5 Sky
6 Meadow
7 Ivory

Did you know? The crossed arms have joints where they meet. When the arms open upward, they raise the platform. When they fold, the platform comes straight back down toward its base.

Bridge Crane

Why do some cranes roll on tracks?



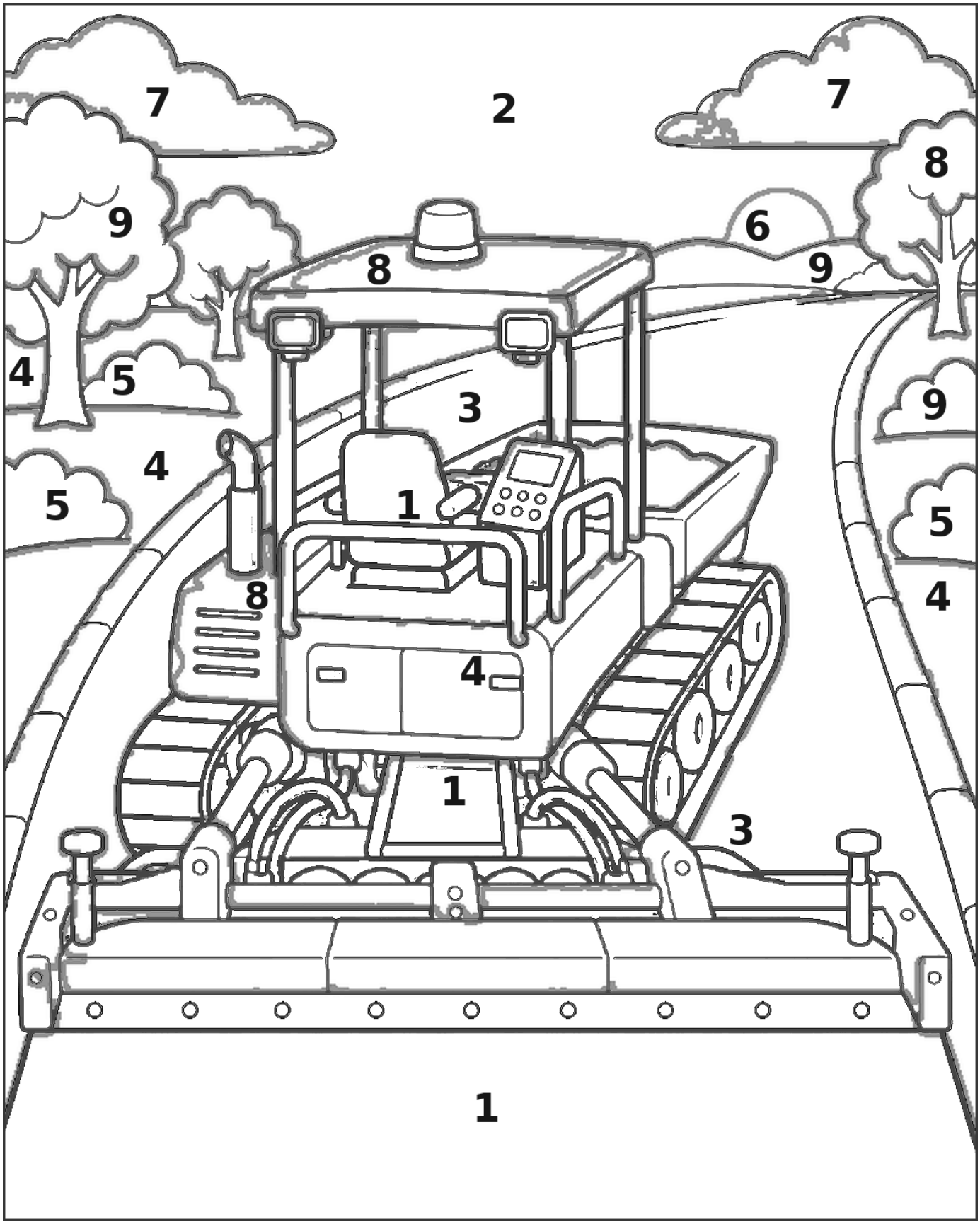
1 Lilac	**2 Sage**	**3 Apricot**
4 Sky	**5 Parchment**	**6 Butter**
7 Pearl	**8 Chestnut**	**9 Moss**

Did you know? A crawler crane uses wide tracks that support its weight over a large area. A long boom reaches the load while the tracks stay on the ground. The triangular openings of a lattice boom give it a strong framework without filling the whole shape with steel.

Asphalt Paver

What makes the layer behind an asphalt paver flat?





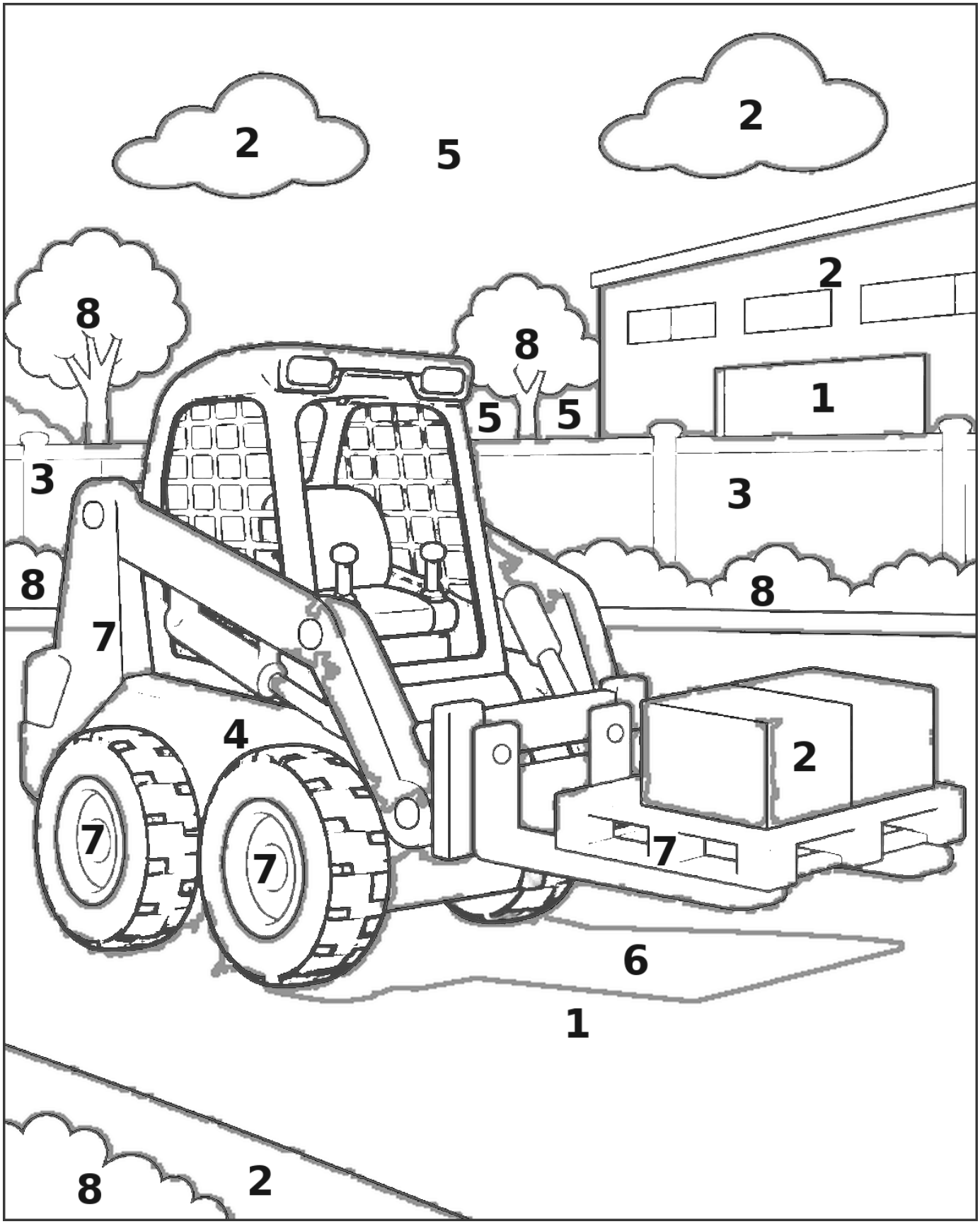
1 Charcoal
2 Sky
3 Pearl
4 Gold
5 Rust
6 Ivory
7 Parchment
8 Butter
9 Honey

Did you know? Fresh asphalt goes into a hopper. The machine moves it toward a wide plate at the back called a screed. The screed spreads and shapes the layer as the paver advances.

Skid Steer Loader

How can a small loader pick up a pallet?



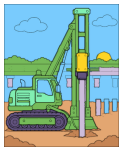


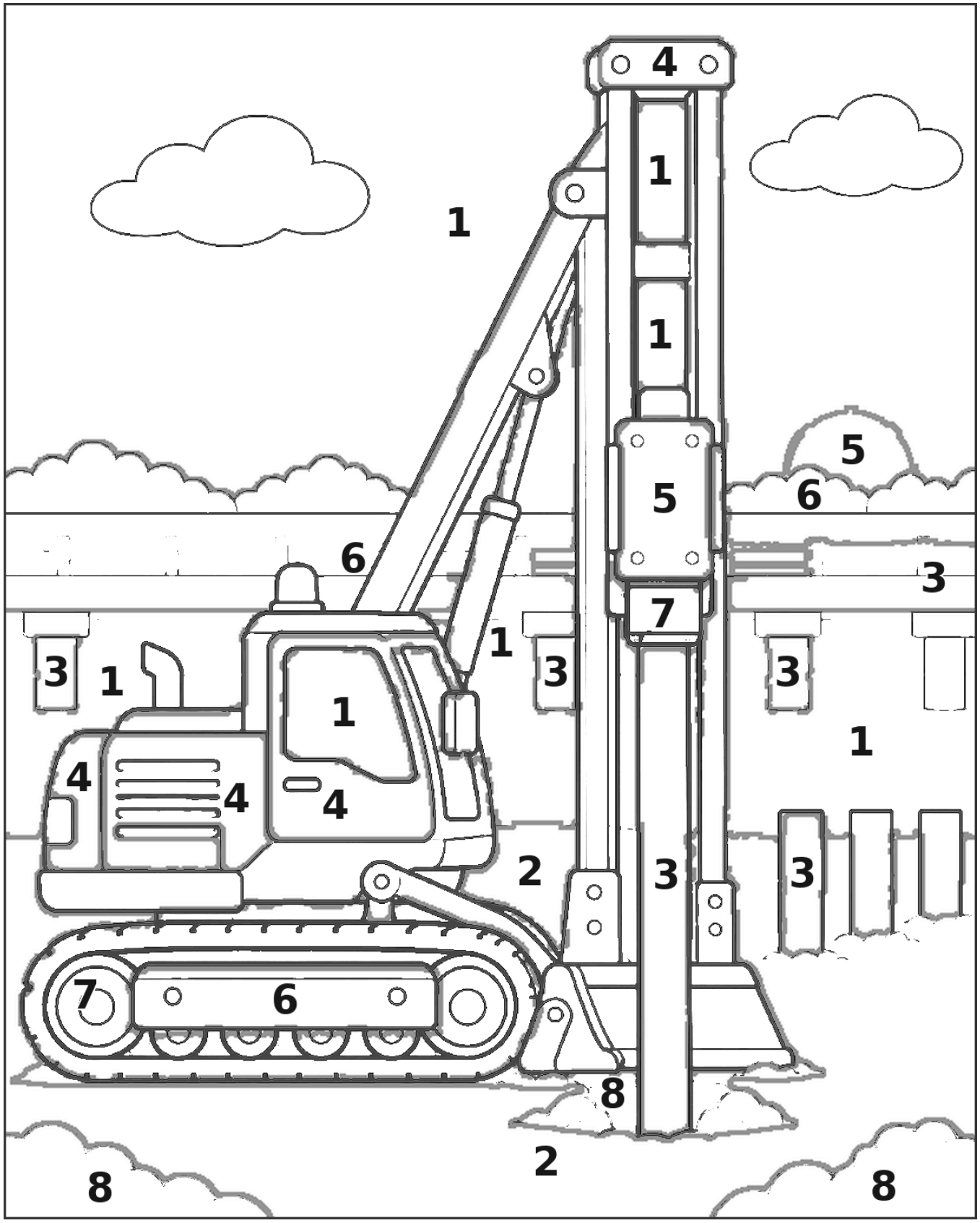
1 Lagoon
2 Snow
3 Seafoam
4 Plum
5 Sky
6 Ink blue
7 Gold
8 Moss

Did you know? A loader can exchange its bucket for pallet forks. The two forks slide into the spaces under a pallet so the load rides on top of them. The loader's arms raise the fork assembly.

Pile Driver

Why do builders drive piles into the ground?



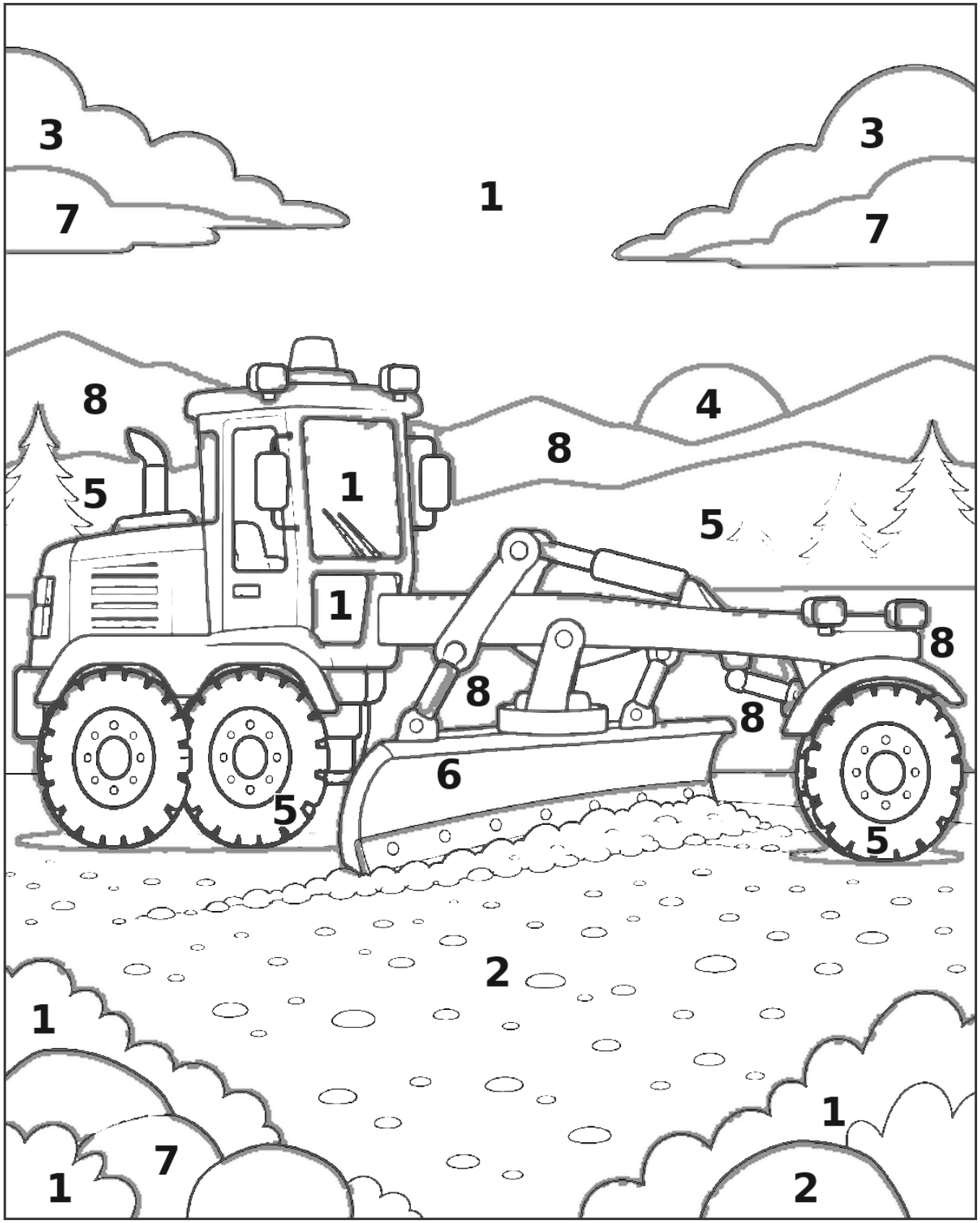


1 Sky
2 Apricot
3 Lilac
4 Seafoam
5 Gold
6 Moss
7 Plum
8 Copper

Did you know? A long pile can carry part of a structure's load into deeper ground. A piling rig guides the pile as a hammer drives it downward, a little at a time. Several piles can support one foundation.

Motor Grader

Why is the grader's blade in the middle?

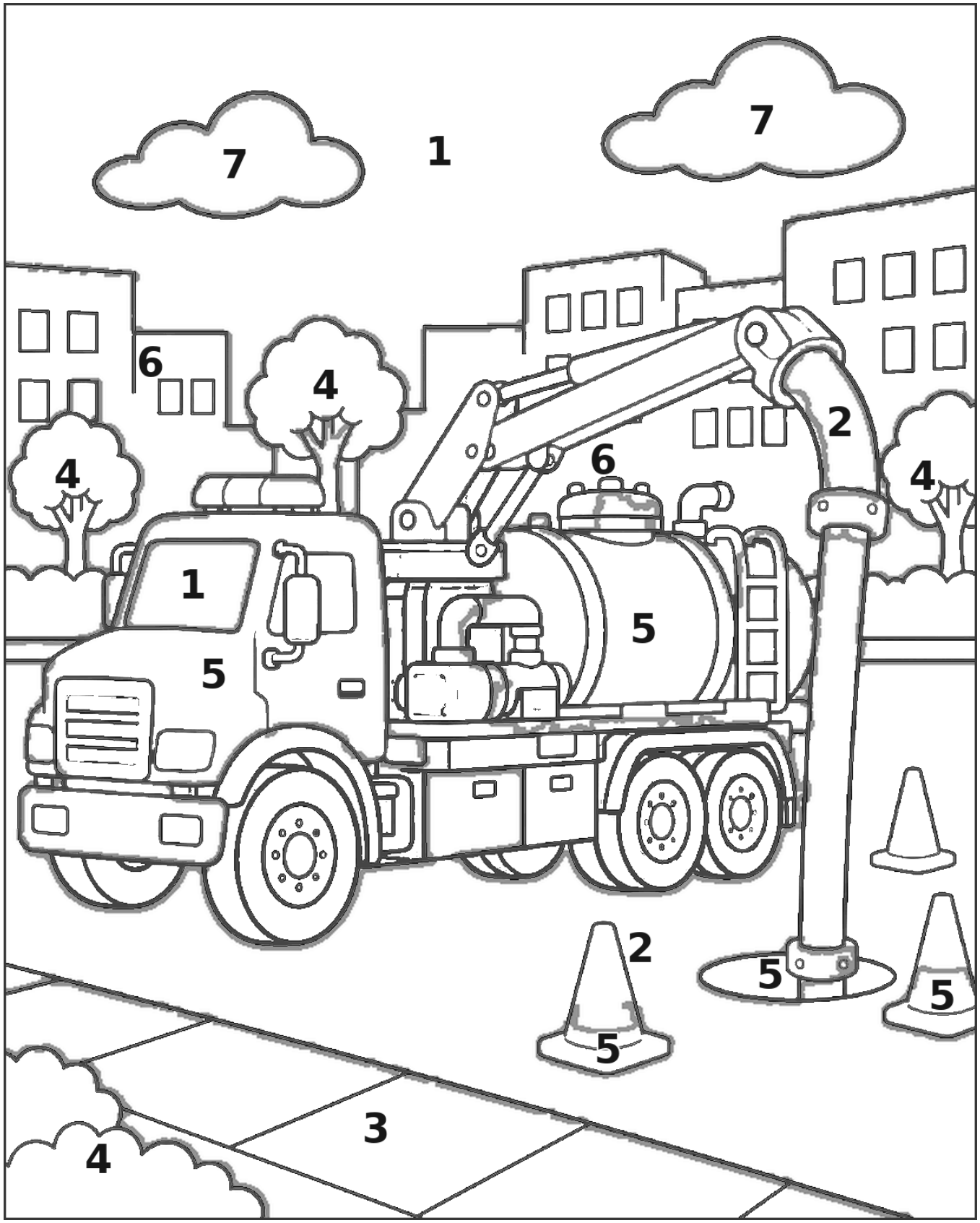


1 Sky
2 Mauve
3 Parchment
4 Ivory
5 Plum
6 Gold
7 Lilac
8 Rose

Did you know? The grader's blade works between the front and rear wheels. The blade can turn and tilt as the grader reshapes a gravel road. A slight slope at the edges can give rainwater a way to drain.

Vacuum Excavator

How can a truck scoop soil with a hose?

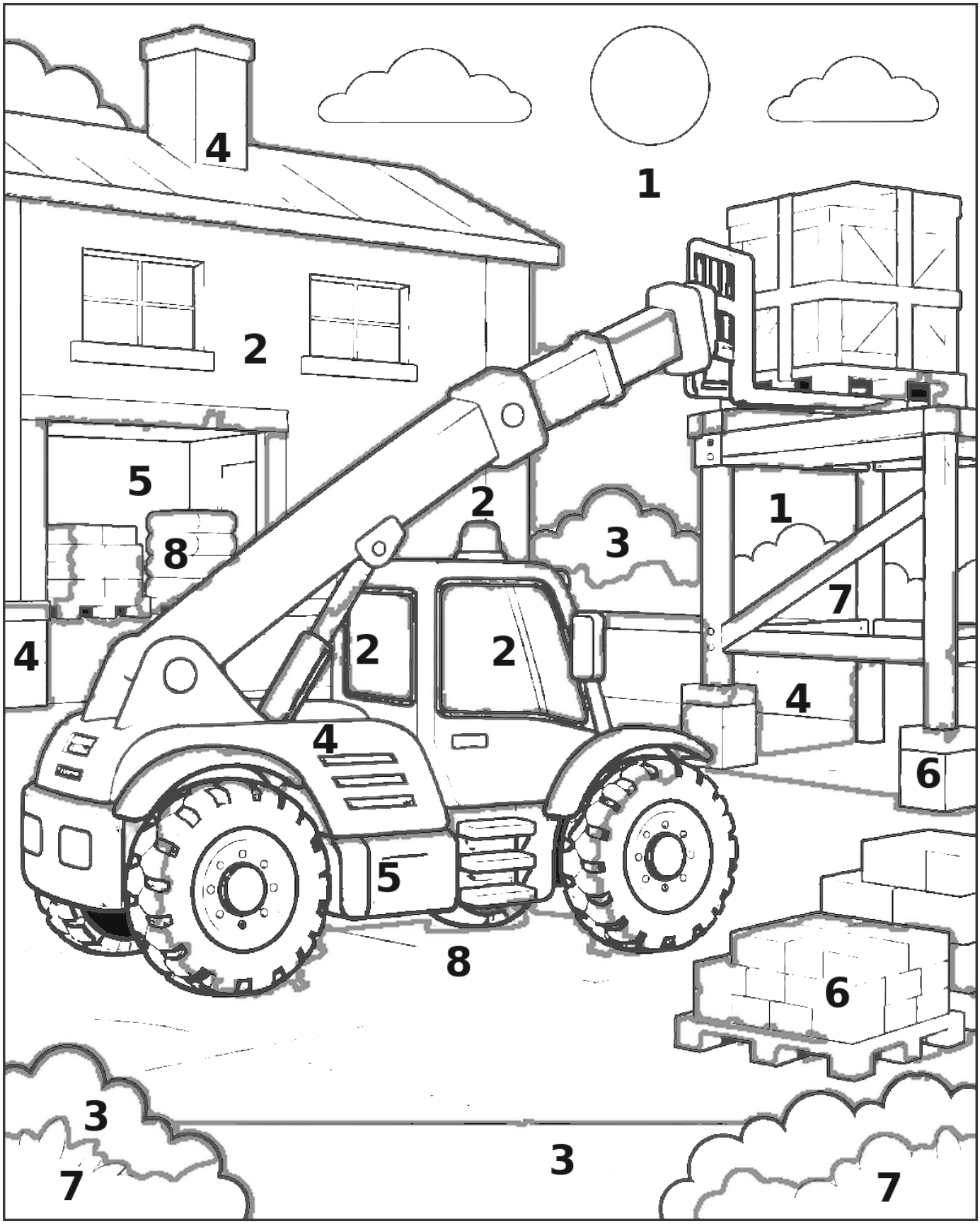


1 Sky
2 Mauve
3 Cream
4 Sage
5 Rust
6 Dusk
7 Snow

Did you know? A vacuum excavator draws loosened soil through a large hose into a tank. Crews can remove material in a small area and expose buried lines. Look for the path the soil takes from the ground to the truck.

Telescoping Forklift

How does a telehandler reach farther than its wheels?



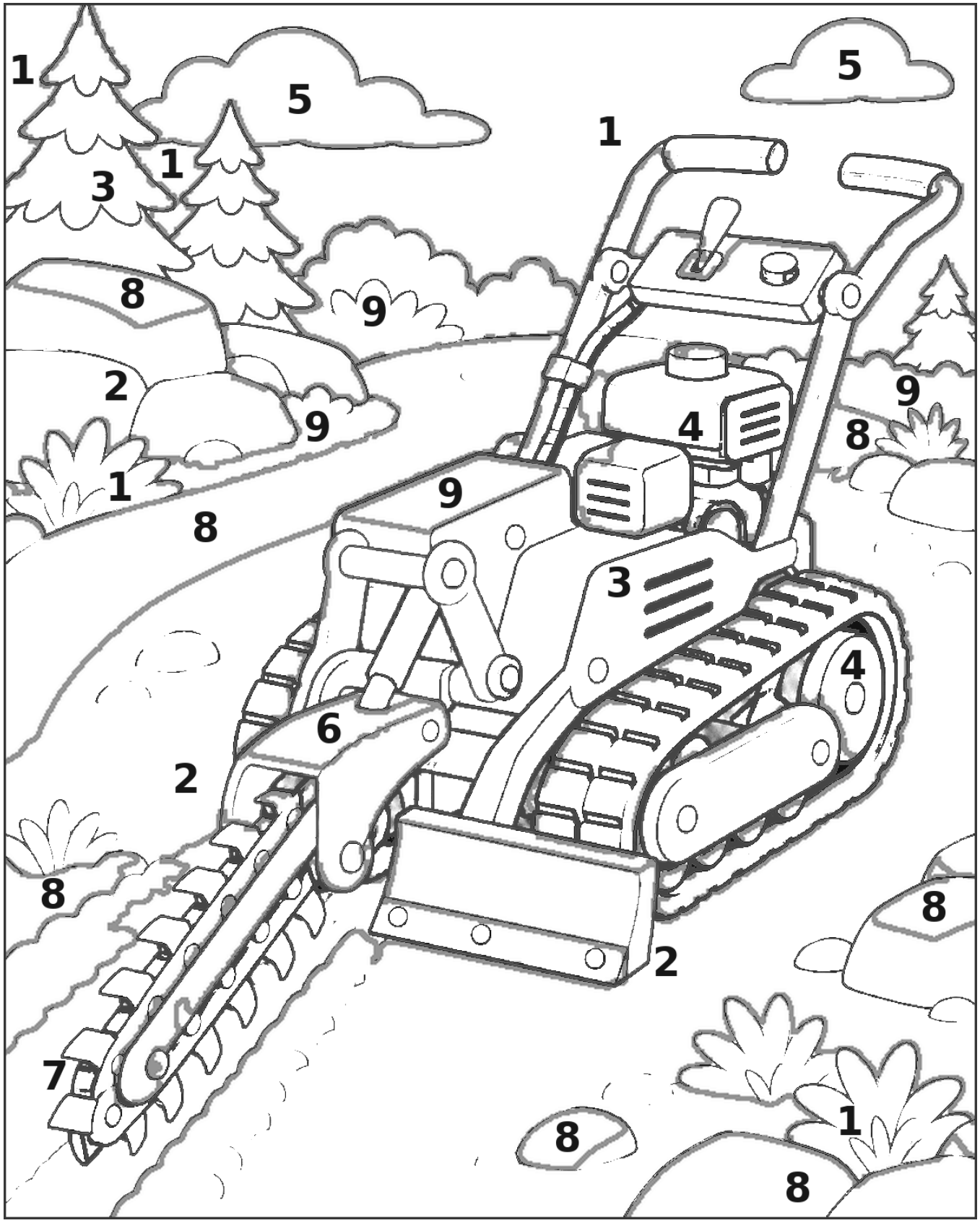
1 Cream
2 Sky
3 Sage
4 Honey
5 Ink blue
6 Chestnut
7 Meadow
8 Oat

Did you know? The big boom has sections that slide out, like a telescope. The forks stay on the far end of the boom. That lets the machine reach forward or upward to place a load.

Chain Trencher

How does a trencher make a long, narrow cut?



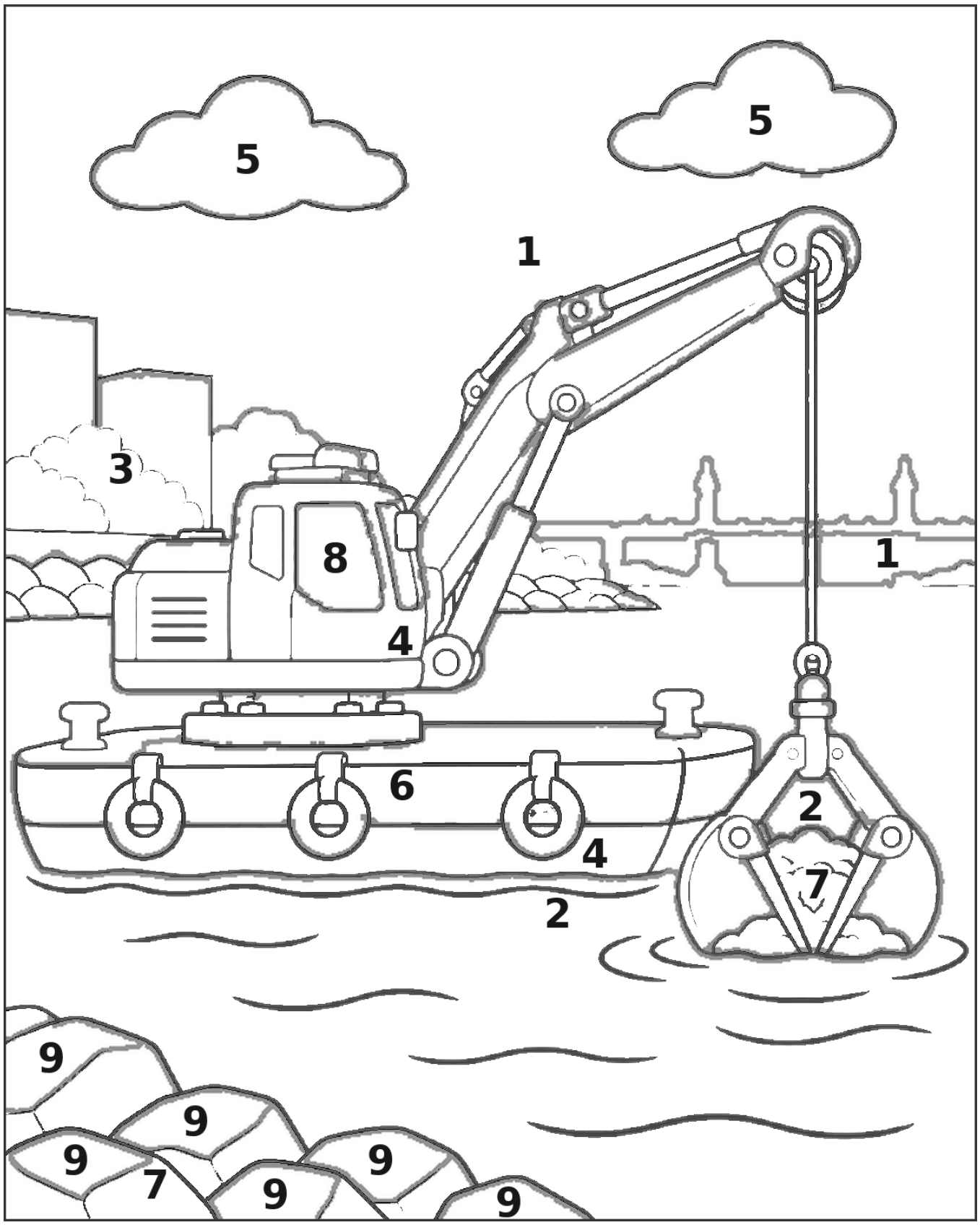


1 Sky
2 Gold
3 Meadow
4 Plum
5 Parchment
6 Ivory
7 Chestnut
8 Peach
9 Sage

Did you know? Teeth move around a loop called a digging chain. They cut and lift soil as the machine travels steadily along the ground. The cut can leave a narrow passage for a cable or a pipe.

Dredging Barge

How does a bucket pick up mud under water?



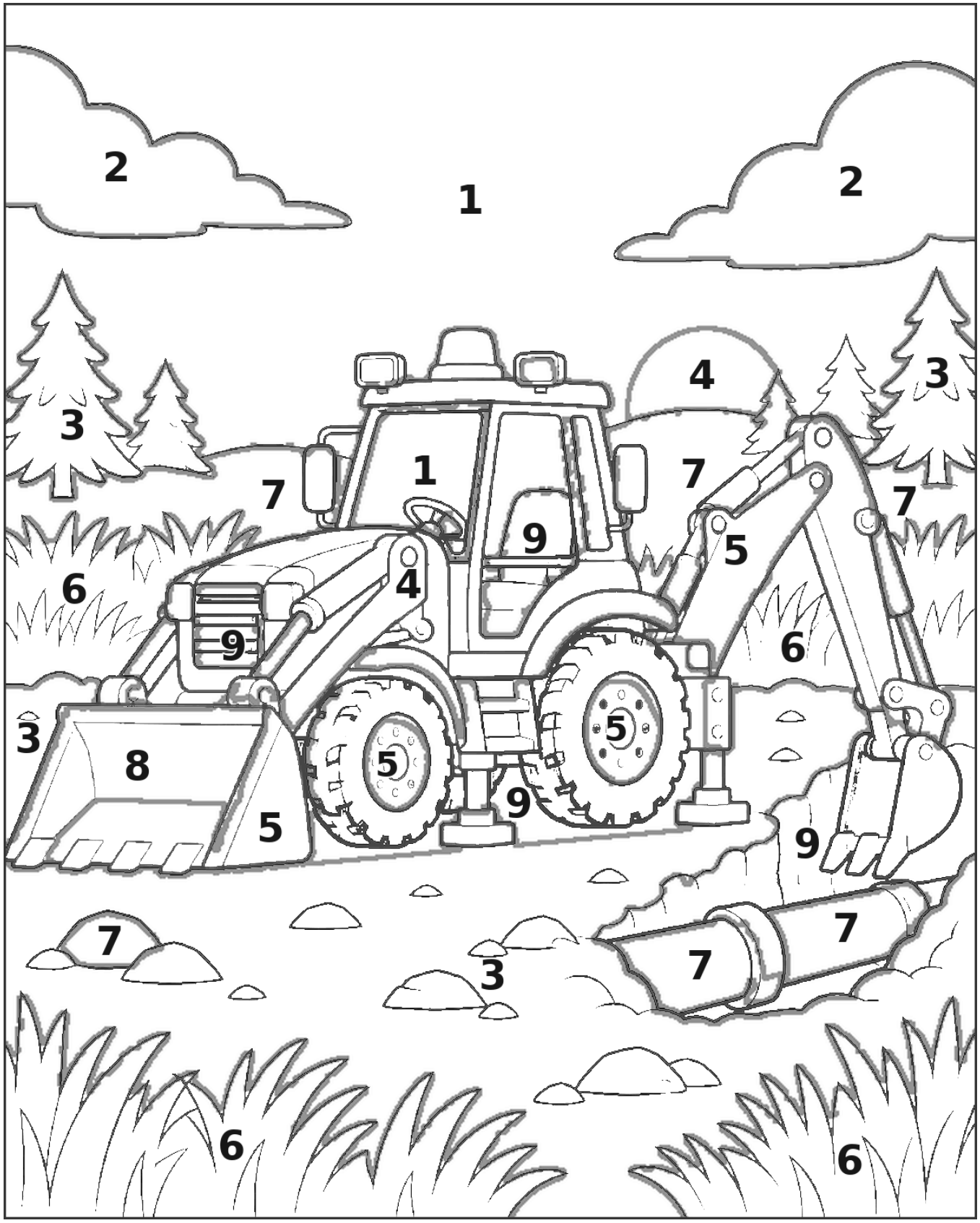
1 Peach
2 Lagoon
3 Moss
4 Copper
5 Snow
6 Denim
7 Clay
8 Sky
9 Stone

Did you know? A clamshell bucket has two halves that close around material like a pair of jaws. A crane lowers it, closes it around sediment, and lifts the sediment away. From a floating barge it can reach below the waterline.

Backhoe and Pipe

Why does a backhoe loader have equipment at both ends?





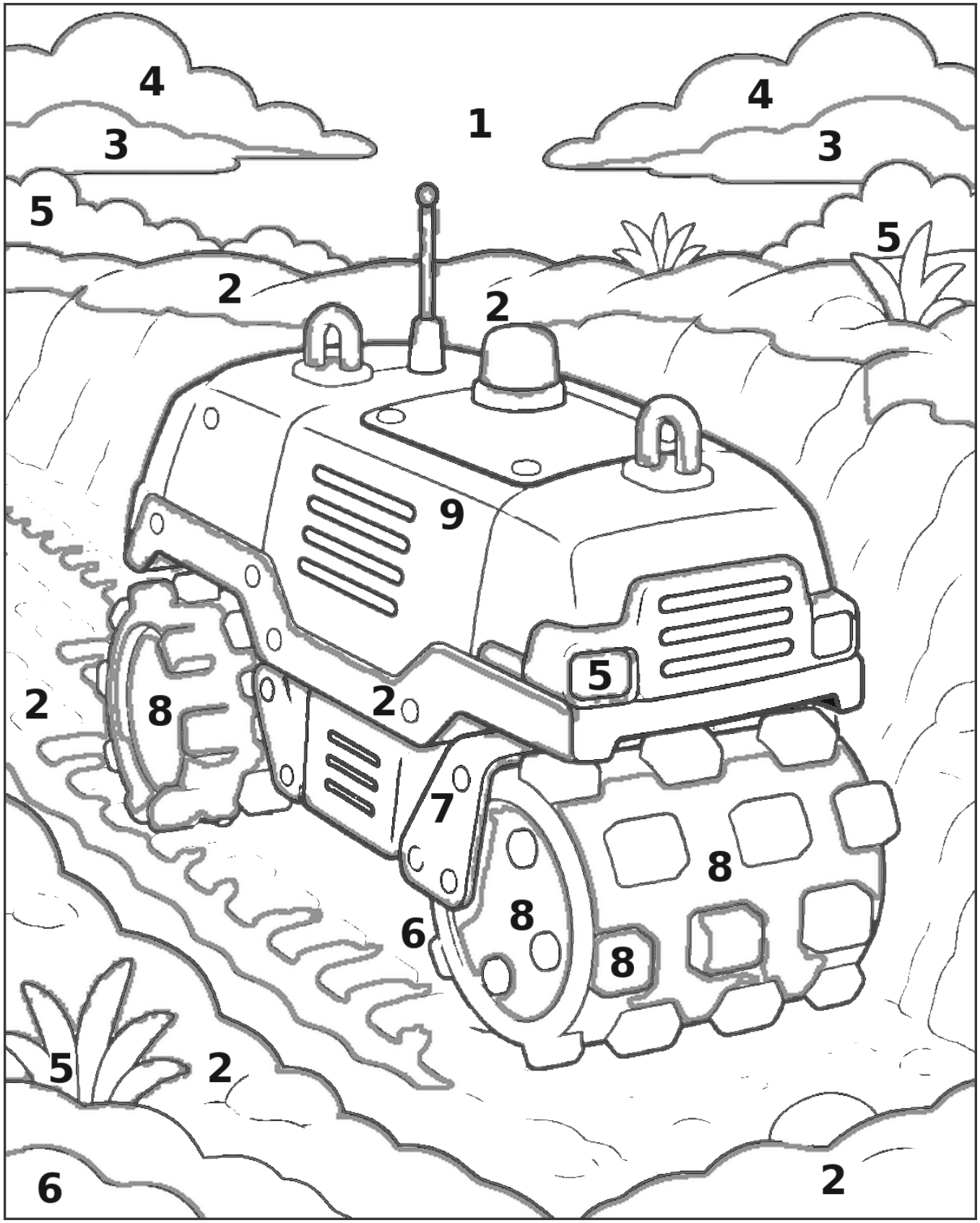
1 Sky
2 Parchment
3 Berry
4 Ivory
5 Butter
6 Gold
7 Mauve
8 Honey
9 Plum

Did you know? The front loader bucket can carry soil and the digging arm behind the cab can reach into a trench. The two tools give one machine several jobs. Look for the stabilizers beside the wheels that help support it when the backhoe digs.

Trench Roller

Why do these drums have rows of raised feet?



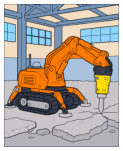


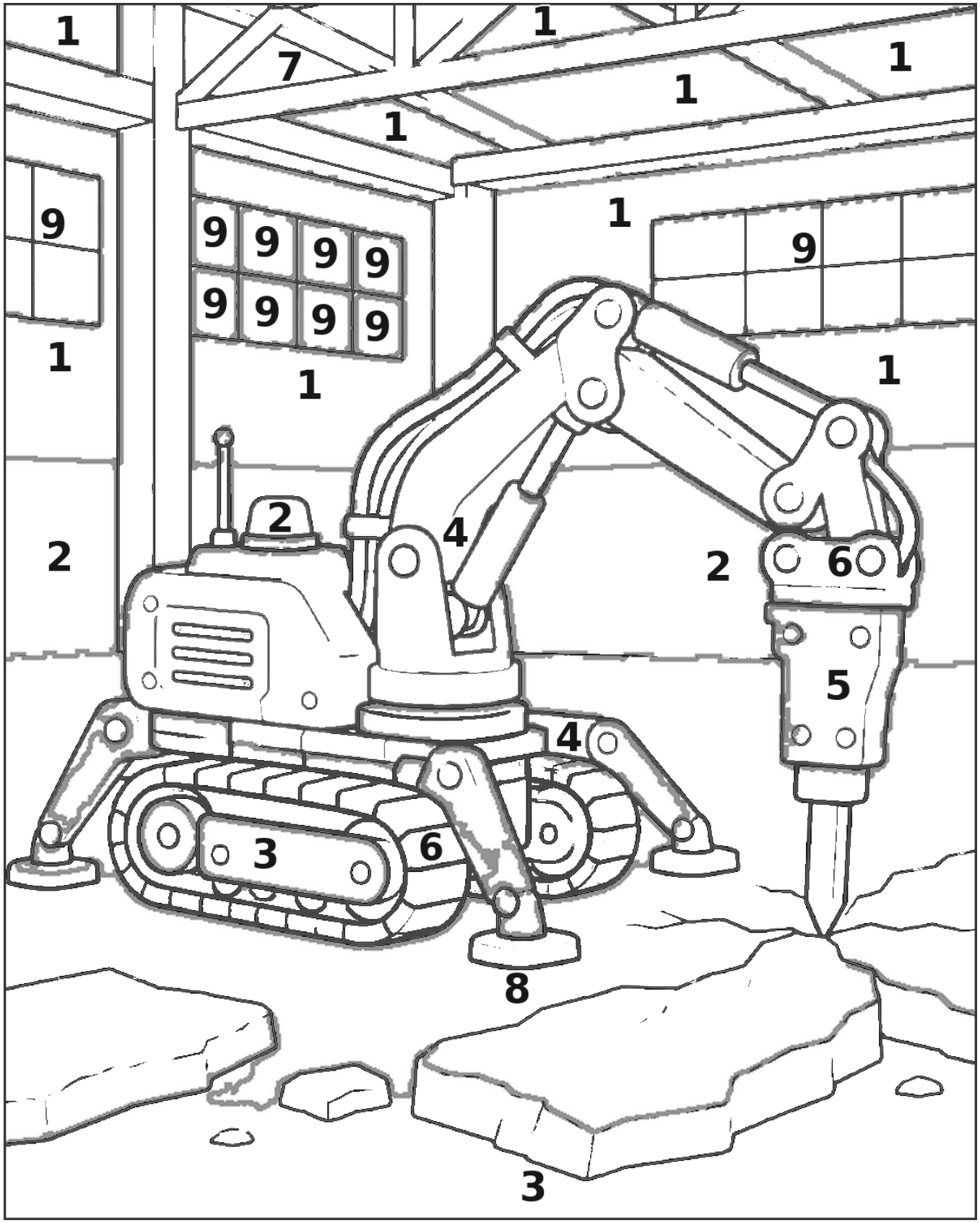
1 Sky
2 Honey
3 Lilac
4 Parchment
5 Moss
6 Copper
7 Dusk
8 Gold
9 Lagoon

Did you know? The small raised feet press into loose soil while the drums roll. They help compact the fill as it goes back into the trench. A compact machine can reach places where a wide road roller would not fit.

Demolition Robot

Why might a demolition machine have a remote control?





1 Cream
2 Sky
3 Periwinkle
4 Honey
5 Gold
6 Charcoal
7 Lagoon
8 Lilac
9 Ice

Did you know? An operator can control a small machine from a distance while its tool breaks old concrete. The short tracks help it fit through tight indoor spaces. Different tools can be attached to the end of its arm.