FOR GROWN-UPS

Big Machines at Work

A guide to the book, from Torkel's Garage, Volume 1



AGES 3–5

ABOUT THIS BOOK

Big Machines at Work is 50 missions in 5 chapters.

Each spread has two sides: a true fact and a math pit stop on the left, and the activity on the right: a puzzle or a picture to finish and color.

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42 math pit stops

AFTER EACH PIT STOP, ASK

"How did you see it? Can you show it another way?"

HOW TO HELP

Let your child try first. A wrong answer is part of the game: ask what they tried, then try again together.

Ask your child to show you a favorite page, and to tell you what they did there.

1 What your child did

Every activity and the skill it practiced, and its Common Core link. Check the ones you have seen your child do.

GRADE a Common Core standard for kindergarten STRETCH from a later grade, met here as an early look

Each grade link names the Common Core math standards a task relates to, so you can see where it sits in school math. The pages practice a skill; they are not a test of it.

DRAW AND COLOR — 5 activities

	ACTIVITY	PRACTICED	COMMON CORE	PAGES
☐	**Color every part** Colored every part of pictures.	Coloring carefully inside each outline.	—	5, 13, 35, 37, 45, 47, 51, 53, 57, 61, 67, 85, 97, 99, 101
☐	**Color the whole scene** Colored whole scenes.	Coloring a whole scene with their own choices.	—	7, 9, 15, 21, 29, 59, 65, 71, 73, 93
☐	**Join the dots, then color** Joined dots in order.	Counting on in order.	KINDERGARTEN K.CC.A.1	11, 27, 33, 39, 69, 81, 91
☐	**Draw into the empty space** Added their own drawing to a scene.	Adding their own drawing to a scene.	—	19, 25, 31, 49, 75
☐	**Invent the one that ends the chapter** Invented and drew their own.	Making an original drawing from an open prompt.	—	23, 43, 63, 83, 103

PUZZLES — 1 activity

	ACTIVITY	PRACTICED	COMMON CORE	PAGES
☐	**Find the hidden things, then color** Searched busy pictures for hidden things.	Searching a busy picture carefully and counting what they find.	KINDERGARTEN K.CC.B.5	17, 41, 55, 77, 79, 87, 89, 95

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2 The math pit stops

After each pit stop, ask: How did you see it? Can you show it another way?

Ten-frames

left-hand pages 18, 32, 48

GOAL	See how many more make ten, without counting from one.
ASK THIS	How many squares are empty?
COMMON MISTAKE	Counting the full squares again instead of the empty ones.
MAKE IT EASIER	Put counters on the frame first, one at a time.
MAKE IT HARDER	Show fewer dots, so more must be drawn.
COMMON CORE	KINDERGARTEN K.OA.A.4

The number line

left-hand pages 20, 60, 66

GOAL	Find and read numbers on a line from 0 to 10.
ASK THIS	Which written number is it closest to?
COMMON MISTAKE	Counting the first tick as 1 instead of 0.
MAKE IT EASIER	Point at each tick and count along together.
MAKE IT HARDER	Ask for the number just before or after the arrow.
COMMON CORE	KINDERGARTEN K.CC.A.2

Counting on and back

left-hand pages 22, 56, 88

GOAL	Count on and back by one, within 10 and then 20.
ASK THIS	Which number comes next, and which comes before?
COMMON MISTAKE	Counting on when the numbers go down.
MAKE IT EASIER	Say each number aloud, pointing at its stone.
MAKE IT HARDER	Start from a bigger number.
COMMON CORE	KINDERGARTEN K.CC.A.2

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Balance scales

left-hand pages 34, 70, 102

GOAL	See that the side with more cubes is the heavier side.
ASK THIS	Which side has more cubes?
COMMON MISTAKE	Choosing the side with wider-spread cubes, not the side with more.
MAKE IT EASIER	Count the cubes on each side with a finger.
MAKE IT HARDER	Compare two sides that are one cube apart.
COMMON CORE	KINDERGARTEN K.MD.A.2, K.CC.C.6

Sharing fairly

left-hand pages 38, 62, 94

GOAL	Share things equally between two plates.
ASK THIS	How do you know each plate got the same?
COMMON MISTAKE	Putting more things on one plate than the other.
MAKE IT EASIER	Share real things one at a time, plate by plate.
MAKE IT HARDER	Share a bigger number of things.
COMMON CORE	KINDERGARTEN K.CC.B.5

The +1 machine

left-hand pages 64, 78, 96

GOAL	See that the machine adds one to every number that goes in.
ASK THIS	What does the machine do to every number?
COMMON MISTAKE	Writing the same number that went in.
MAKE IT EASIER	Count on one on your fingers.
MAKE IT HARDER	Make a machine that adds two.
COMMON CORE	KINDERGARTEN K.OA.A.2

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Pack the tens

left-hand pages 68, 74, 100

GOAL	See that ten loose ones make one ten, and some more.
ASK THIS	How many are in the loop, and how many are loose?
COMMON MISTAKE	Looping more or fewer than ten.
MAKE IT EASIER	Count out ten counters and put a band round them.
MAKE IT HARDER	Try numbers up to 19.
COMMON CORE	KINDERGARTEN K.NBT.A.1

Same number, many ways

left-hand pages 72, 76, 82

GOAL	See 11 to 19 as a full ten and some more.
ASK THIS	How many dots are loose, outside the ten-frame?
COMMON MISTAKE	Circling the loose dots' count, which is only part of the number.
MAKE IT EASIER	Call the full frame ten, then count on one at a time.
MAKE IT HARDER	Try numbers up to 19.
COMMON CORE	KINDERGARTEN K.NBT.A.1

Number house

left-hand pages 80, 92, 98

GOAL	See that two numbers make a bigger one.
ASK THIS	Here is 2. What goes with it to make 5?
COMMON MISTAKE	Writing the whole again, not the part that is missing.
MAKE IT EASIER	Count the whole in counters, then hide some under a hand.
MAKE IT HARDER	Try wholes up to 10.
COMMON CORE	KINDERGARTEN K.OA.A.3

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3 The big machines we met

Point to one and ask: what do you remember about it?

CHAPTER 1 · DIGGING IN

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- ☐ Tall Smasher 7
- ☐ Push Dozer 9
- ☐ Pile Pounder 11
- ☐ Backhoe Buddy 13
- ☐ Well Driller 15
- ☐ Trench Digger 17
- ☐ Mini Digger 19
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CHAPTER 2 · CARRY AND DUMP

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- ☐ Sky Basket 51
- ☐ Zigzag Lift 53
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- ☐ Fork Lifter 57
- ☐ Hook Hauler 59
- ☐ Long Reacher 61

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- ☐ Scoop Loader 71
- ☐ Brick Pickup 73
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- ☐ Flat Roller 91
- ☐ Snow Pusher 93
- ☐ Grass Mower 95
- ☐ Trash Truck 97
- ☐ Chip Chomper 99
- ☐ Hay Roller 101

4 Answers

By chapter: each spread's pit stops on its left-hand page, then its activity.

CHAPTER 1 · DIGGING IN

Pages 4–5 Big Digger

Pit stop, p. 4 — Trace D and d (D is for Digger).

Pages 6–7 Tall Smasher

Pit stop, p. 6 — pattern A: square; pattern B: circle

Pages 8–9 Push Dozer

Pit stop, p. 8 — Trace 1, then color 1 circle.

Pages 10–11 Pile Pounder

Pit stop, p. 10 — more stars: the right box, 5 against 3

Pages 12–13 Backhoe Buddy

Pit stop, p. 12 — Follow the waves and the zigzags.

Pages 14–15 Well Driller

Pit stop, p. 14 — the dice, top to bottom: 5, 6 and 2, each to its own number

Pages 16–17 Trench Digger

Pit stop, p. 16 — Trace the circle, the square and the triangle.

Activity, p. 17 — How many dirt piles? 3

Find the long trench: 1

Pages 18–19 Mini Digger

Pit stop, p. 18 — 3 more make 10

Pages 20–21 Little Scooper

Pit stop, p. 20 — 1

CHAPTER 1 · DIGGING IN

Pages 22–23 Dream Digger

Pit stop, p. 22 — 1 is missing

CHAPTER 2 · CARRY AND DUMP

Pages 24–25 Giant Hauler

Pit stop, p. 24 — pattern A: triangle; pattern B: triangle

Pages 26–27 Field Tractor

Pit stop, p. 26 — Trace 2, then color 2 circles.

Pages 30–31 Sand Tipper

Pit stop, p. 30 — Trace the star, the heart and the diamond.

Pages 32–33 Chilly Truck

Pit stop, p. 32 — 1 more make 10

Pages 34–35 Log Hauler

Pit stop, p. 34 — left: 4 cubes, not 2

Pages 36–37 Crop Cutter

Pit stop, p. 36 — Trace C and c (C is for Cutter).

Pages 38–39 Dumpy Truck

Pit stop, p. 38 — 2 each, 0 left

Pages 40–41 Car Carrier

Activity, p. 41 — How many small cars? 2
Find the moon: 1
Find the star: 1

CHAPTER 2 · CARRY AND DUMP

Pages 42–43 Dream Dumper

Pit stop, p. 42 — Follow the bumps and the cups.

CHAPTER 3 · LIFT IT HIGH

Pages 44–45 Hook Crane

Pit stop, p. 44 — pattern A: triangle; pattern B: square

Pages 46–47 Crawler Crane

Pit stop, p. 46 — Trace 3, then color 3 circles.

Pages 48–49 Claw Grabber

Pit stop, p. 48 — 4 more make 10

Pages 50–51 Sky Basket

Pit stop, p. 50 — Trace the oval, the rectangle and the pentagon.

Pages 52–53 Zigzag Lift

Pit stop, p. 52 — Trace Z and z (Z is for Zigzag).

Pages 54–55 Loader Tractor

Pit stop, p. 54 — fewer circles: the left box, 3 against 5

Activity, p. 55 — How many clouds? 3
Find the sun: 1

Pages 56–57 Fork Lifter

Pit stop, p. 56 — 5 is missing

Pages 58–59 Hook Hauler

Pit stop, p. 58 — the dots, top to bottom: 9, 4 and 5, each to its own number

CHAPTER 3 · LIFT IT HIGH

Pages 60–61 Long Reacher

Pit stop, p. 60 — 9 marked

Pages 62–63 Dream Lifter

Pit stop, p. 62 — 5 each, 0 left

CHAPTER 4 · MIX AND POUR

Pages 64–65 Spin Mixer

Pit stop, p. 64 — in 2, out 2

Pages 66–67 Concrete Pump

Pit stop, p. 66 — 6

Pages 68–69 Water Tanker

Pit stop, p. 68 — 1 ten and 5 ones

Pages 70–71 Scoop Loader

Pit stop, p. 70 — right: 4 cubes, not 1

Pages 72–73 Brick Pickup

Pit stop, p. 72 — 14 and 10 + 4; not 4 alone

Pages 74–75 Rock Cruncher

Pit stop, p. 74 — 1 ten and 1 one

Pages 76–77 Pipe Carrier

Pit stop, p. 76 — 15 and 10 + 5; not 5 alone

Activity, p. 77 — How many big pipes? 5

How many straps? 2

CHAPTER 4 · MIX AND POUR

Pages 78–79 Stone Spreader

Pit stop, p. 78 — in 3, out 5
Activity, p. 79 — How many falling stones? 4
Find the road: 1

Pages 80–81 Reel Truck

Pit stop, p. 80 — 2 (1 and 2 make 3)

Pages 82–83 Dream Mixer

Pit stop, p. 82 — 19 and 10 + 9; not 9 alone

CHAPTER 5 · ROLL IT SMOOTH

Pages 84–85 Smooth Grader

Pit stop, p. 84 — the same: 9 hearts in each box

Pages 86–87 Line Painter

Activity, p. 87 — How many paint drops? 3
Find the paint gun: 1

Pages 88–89 Brush Sweeper

Pit stop, p. 88 — 17 is missing
Activity, p. 89 — How many round brushes? 3
Find the puddle: 1

Pages 90–91 Flat Roller

Pit stop, p. 90 — 4 dots: the top and middle boxes (the bottom has 5)

Pages 92–93 Snow Pusher

Pit stop, p. 92 — 4 (1 and 4 make 5)

CHAPTER 5 · ROLL IT SMOOTH

Pages 94–95 Grass Mower

Pit stop, p. 94	5 each, 0 left
Activity, p. 95	Find the round mower: 1
	Find the glass cab: 1

Pages 96–97 Trash Truck

Pit stop, p. 96	in 7, out 10

Pages 98–99 Chip Chomper

Pit stop, p. 98	2 (3 and 2 make 5)

Pages 100–101 Hay Roller

Pit stop, p. 100	1 ten and 6 ones

Pages 102–103 Dream Roller

Pit stop, p. 102	right: 5 cubes, not 1

5 More Torkel's Garage

Each book is a quest of its own with Torkel, for its own age, so any one of them makes a gift for another reader.

Ages 6–8 Vol. 2



Extreme Off-Road Adventures

Monster Trucks, Rock Crawlers, Rescue Rigs and Future Machines to Color, Complete and Build

Ages 9–12 Vol. 3



Japanese Car Legends

Japanese Cars to Color, Complete and Design, from Tiny Kei Cars to Race-Winning Legends

Ages 3–5 Vol. 1 · this book



Big Machines at Work

Diggers, Dumpers, Cranes and Mixers to Color, Find and Finish

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