SIMPLIFYING RADICALS

PROGRESS MONITORING PROBES

6 FORMS

GR. 8-10



My name: _____

Read. Show your work. Write the answer.

1. What is the biggest perfect square that goes into this number?

   90 — Show your work — Biggest = ☐

2. Split the number under the root. Use the biggest perfect square.

   $\sqrt{48}$ — Show your work — $\sqrt{\square \times \square}$ (square, other)

3. Simplify. Write a number times a root.

   $\sqrt{50}$ — Show your work — ☐ $\sqrt{\square}$ (outside, inside)

4. Simplify. Write a number times a root.

   $\sqrt{72}$ — Show your work — ☐ $\sqrt{\square}$ (outside, inside)

Simplifying Radicals · Form A · Page 1 of 2

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This is a fillable PDF

- Open it in a PDF reader (Adobe Acrobat Reader, Preview, or your browser), click into a line or box, type, and Save As once per student.
- Print one copy of both pages of a form per student per week: the student writes on the form and that same sheet is the one you score.
- It works offline. No account, no subscription, no internet connection needed after you download it.

Student data

Completed pages carry a real student's name and scores. Store, hand over and destroy this file the same way you would any other student record.

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PREVIEW

Binder Cover, Spine Label & Divider Tabs

A binder cover, 10 divider tabs, and a short setup list.

Binder cover & spine label

Student _____ Case manager _____ School year _____

Goal start date _____ Next review date _____

Cut along the outer edge and use as a binder cover, a folder label, or a clipboard cover for this student's probe folder.

Divider tabs — print and cut

01 Start Here
The six-step routine, page 3.

02 Goal & Directions
The written goal and how to give and score a form, pages 5-6.

03 Forms A-C
Student pages for forms A, B and C, pages 7-12.

04 Forms D-F
Student pages for forms D, E and F, pages 13-18.

05 Answer Keys
Keys for forms A-F, pages 19-20.

06 Teacher Notes
Reading the misses, page 21.

07 Reference & Steps
Perfect squares and the step-by-step page, pages 22-23.

08 Graph & Log
The weekly plot and the aim line, page 24.

09 Caseload & Example
Every student on one grid, and a filled-in log, pages 25-26.

10 Family Update
The note home and the handoff sheet, page 27.

Before the first probe

- Write the goal from the sample and change every bracket for this student.
- Give the baseline: three forms, three different days, before the first plotted point.
- Share the rotation (A, B, C, D, E, F) with anyone else who might give a form.

PREVIEW

Giving and Scoring the Probe

The same way every week, so a change in the score is a change in the student.

Giving the probe

- Say: "Read each problem. Show your work in the box. Write your answers in the answer boxes."
- Correct: every answer box on the problem is right. Problems 1, 6, 7 and 8 have one answer; problems 2, 3, 4 and 5 have two, and are right only when both are. Your team decides whether partial credit counts and whether the work box is scored. Write that rule on the line below before the baseline.
- Note which kind of problem each miss falls on (the key marks it): factor, simplify, outside number or check.
- Time: your team decides whether the probe is timed. If it is, write the limit on the line below; if not, let the student finish all eight.

What is on every form

- Two student pages, four problems a page, 8 problems in all.
- Two factor, two simplify, two outside-number and two check problems, in the same places on every form.
- No chart is printed on the student pages. If the IEP allows a perfect squares chart, page 22 can be that chart.

Factor

Problems 1, 2. Problem 1: the biggest perfect square that goes into a number. Problem 2: split $\sqrt{n}$ into that square times the other number.

Simplify

Problems 3, 4. The answer is a number times a root. Problem 4 uses a larger number, where more than one perfect square goes in.

Outside number

Problems 5, 6. Problem 5 starts with a number already outside the root, so the student multiplies. Problem 6 puts a number and root back under one root.

Check

Problems 7, 8. Problem 7: ALREADY SIMPLE or CAN SIMPLIFY. Problem 8: a student's answer is RIGHT, NOT DONE (equal, but it can be simplified more) or WRONG (not equal).

If the student needs the problems read aloud, or other help

Follow the supports in the student's IEP, give them the same way each week, and write them on the goal page so the next person gives the probe the same way.

Notes for whoever gives the probe next (supports, any time limit)

PREVIEW

Preview - Bright Path Shed

My name: _____

Read. Show your work. Write the answer.

1 What is the biggest perfect square that goes into this number?

90

Show your work

Biggest = ☐

2 Split the number under the root. Use the biggest perfect square.

$\sqrt{48}$

Show your work

$\sqrt{\square \times \square}$ (square, other)

3 Simplify. Write a number times a root.

$\sqrt{50}$

Show your work

☐ $\sqrt{\square}$ (outside, inside)

4 Simplify. Write a number times a root.

$\sqrt{72}$

Show your work

☐ $\sqrt{\square}$ (outside, inside)

PREVIEW

Preview - Bright Path Shed

My name: _____

Read. Show your work. Write the answer.

1 What is the biggest perfect square that goes into this number?

Show your work

52

Biggest = ☐

2 Split the number under the root. Use the biggest perfect square.

Show your work

$\sqrt{68}$

$\sqrt{\square \times \square}$ (square × other)

3 Simplify. Write a number times a root.

Show your work

$\sqrt{54}$

☐ $\sqrt{\square}$ (outside, inside)

4 Simplify. Write a number times a root.

Show your work

$\sqrt{147}$

☐ $\sqrt{\square}$ (outside, inside)

PREVIEW

Preview - Bright Path Shed

My name: _____

Read. Show your work. Write the answer.

5 Simplify. Multiply the numbers outside the root.

$4\sqrt{12}$

Show your work

$\square\sqrt{\square}$ (outside, inside)

6 Put the number back under one root.

$5\sqrt{2}$

Show your work

$\sqrt{\square}$ (number)

7 Can this be simplified? Circle one.

$\sqrt{24}$

Show your work

Circle one:

- ALREADY SIMPLE
- CAN SIMPLIFY

8 A student wrote this. Circle RIGHT, NOT DONE (can still be simplified) or WRONG.

$\sqrt{90} = 3\sqrt{10}$

Show your work

- RIGHT
- NOT DONE
- WRONG

Color a star when you finish!

PREVIEW

Preview - Bright Path Shed

My name: _____

Read. Show your work. Write the answer.

5 **Simplify. Multiply the numbers outside the root.**

$5\sqrt{8}$

Show your work

$\square\sqrt{\square}$ (outside, inside)

6 **Put the number back under one root.**

$3\sqrt{7}$

Show your work

$\sqrt{\square}$ (number)

7 **Can this be simplified? Circle one.**

$\sqrt{33}$

Show your work

Circle one:

- ALREADY SIMPLE
- CAN SIMPLIFY

8 **A student wrote this. Circle RIGHT, NOT DONE (can still be simplified) or WRONG.**

$\sqrt{44} = 2\sqrt{11}$

Show your work

- RIGHT
- NOT DONE
- WRONG

Color a star when you finish!

PREVIEW

Preview - Bright Path Shed

My name: _____

Read. Show your work. Write the answer.

5 **Simplify. Multiply the numbers outside the root.**

$3\sqrt{45}$

Show your work

$\square\sqrt{\square}$ (outside, inside)

6 **Put the number back under one root.**

$6\sqrt{2}$

Show your work

$\sqrt{\square}$ (number)

7 **Can this be simplified? Circle one.**

$\sqrt{21}$

Show your work

Circle one:

- ALREADY SIMPLE
- CAN SIMPLIFY

8 **A student wrote this. Circle RIGHT, NOT DONE (can still be simplified) or WRONG.**

$\sqrt{108} = 3\sqrt{12}$

Show your work

- RIGHT
- NOT DONE
- WRONG

Color a star when you finish!

PREVIEW

Preview - Bright Path Shed

My name: _____

Read. Show your work. Write the answer.

5 Simplify. Multiply the numbers outside the root.

$2\sqrt{75}$

Show your work

$\square\sqrt{\square}$ (outside, inside)

6 Put the number back under one root.

$3\sqrt{6}$

Show your work

$\sqrt{\square}$ (number)

7 Can this be simplified? Circle one.

$\sqrt{112}$

Show your work

Circle one:

- ALREADY SIMPLE
- CAN SIMPLIFY

8 A student wrote this. Circle RIGHT, NOT DONE (can still be simplified) or WRONG.

$\sqrt{48} = 16\sqrt{3}$

Show your work

- RIGHT
- NOT DONE
- WRONG

Color a star when you finish!

PREVIEW

Teacher Notes - Reading the Misses

Which kind of problem is missed, and what the work box shows, tells you what to teach next.

What this probe measures

- Whether a student can find the biggest perfect-square factor of a number, simplify a square root to a number times a root, work with a number already outside the root, and tell whether an answer is finished.
- A quick weekly check against a goal you write; not a norm-referenced test, no benchmark score.

The factor is written, not its root

- The student answers 16 $\sqrt{3}$ for $\sqrt{48}$, where 4 $\sqrt{3}$ is meant: the perfect square was written outside the root instead of its square root.
- Have the student say "the square root of 16 is 4" before writing. Problem 8 is built to catch this: on two of the six forms the student's answer is wrong in exactly this way.

Stopped one step early

- The student writes 2 $\sqrt{12}$ for $\sqrt{48}$. It is equal, but 12 still has a perfect square (4) in it.
- Teach one more look at the number inside the root. Problem 7 and the NOT DONE choice on problem 8 practice this.

Misses that cluster on one kind of problem

- Factor problems are 1, 2; simplify 3, 4; outside number 5, 6; check 7, 8. These positions are the same on all six forms.
- Several misses on one kind across two forms: reteach that kind with a worked example.
- Problem 5 missed with the inside right: look at the multiplying (outside numbers added, not multiplied).

Step-by-step page (page 23): what the two panels show

- Panel A is $\sqrt{48}$: biggest perfect square 16, 48 = 16 × 3, square root of 16 is 4, answer 4 $\sqrt{3}$, check 4 × 4 × 3 = 48.
- Panel B is $\sqrt{90}$: biggest perfect square 9, 90 = 9 × 10, square root of 9 is 3, answer 3 $\sqrt{10}$, check 3 × 3 × 10 = 90.

The student cannot start

- Do the first problem together, aloud, and let the student do the second.
- Use the step-by-step page at first; fade it and log the change.

This student's scoring rules and notes

PREVIEW

Preview - Bright Path Shed

My name: _____

Fill in each step.

A. Simplify $\sqrt{48}$

Step 1: biggest perfect square that goes in

Biggest = ☐

Step 2: write 48 as square × other

☐ square × ☐ other

Step 3: square root of that perfect square

Root = ☐

Step 4: your answer

☐ outside $\sqrt{\square}$ inside

Step 5: check. Outside × outside × inside =

☐

B. Simplify $\sqrt{90}$

Step 1: biggest perfect square that goes in

Biggest = ☐

Step 2: write 90 as square × other

☐ square × ☐ other

Step 3: square root of that perfect square

Root = ☐

Step 4: your answer

☐ outside $\sqrt{\square}$ inside

Step 5: check. Outside × outside × inside =

☐

PREVIEW

Simplifying Radicals - Caseload Summary

Every student on this goal, on one grid. Eleven rows, eight probes, one decision column.

Teacher / case manager _____ Skill _____ Marking period _____

Student	Base	Crit	P1	P2	P3	P4	P5	P6	P7	P8	Trend	Decision

How to fill it

- One row per student on this skill. Baseline is the median of the first three probes.
- One column per weekly probe; write the score out of 8, not a percent.
- Trend: up, flat or down over the last four probes.
- Decision: keep going, change the teaching, or raise the target.
- Leave a cell blank rather than guess; a gap is more honest than a filled-in score.

What it is for

Grouping. Rows that are flat together are a group; a row that is flat alone is a different question. Take this page to the data meeting instead of ten folders.

PREVIEW

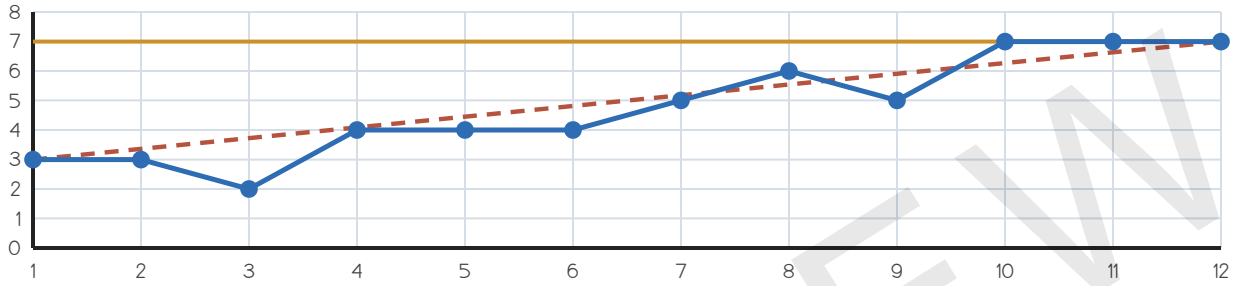
A Filled-In Data Log (Invented Student)

Marcus is invented. Twelve weekly probes, the aim line, the change three low points forced, and the criterion being met.

The goal, as written for Marcus, tenth grade (invented)

By November 20, when given 8 simplifying radicals problems (perfect-square factors; simplify $\sqrt{n}$; $a\sqrt{b}$ forms; check an answer), Marcus will answer 7 of 8 problems correctly on 3 consecutive weekly probes, as measured by teacher-scored simplifying radicals probes (forms A–F).

Marcus's graph (invented): dots are the weekly scores, dashed is the aim line, gold is the criterion of 7



#	Date	Form	Correct	Errors	Graphed	Notes
1	9/8	A	3	5	3	baseline
2	9/9	B	3	5	3	baseline
3	9/10	C	2	6	2	baseline (median of 3, 3, 2 = 3)
4	9/17	D	4	4	4	wrote the factor, not its root (16 for 4)
5	9/24	E	4	4	4	same slip: factor, not root
6	10/1	F	4	4	4	3 under the aim line: added a say-the-root step
7	10/8	A	5	3	5	lists the perfect squares first on every problem
8	10/15	B	6	2	6	finds the biggest square more often
9	10/22	C	5	3	5	stopped one step early
10	10/29	D	7	1	7	criterion score, first time
11	11/5	E	7	1	7	second in a row at 7
12	11/12	F	7	1	7	third in a row: goal met

How to read the log

- Baseline was the median of three forms on three days: 3, 3, 2, so 3. Not the average, not the best.
- The aim line runs from 3 at probe 1 to 7 at probe 12. Probes 4, 5 and 6 (4, 4, 4) sat under it: three in a row, so the teaching changed and the change is written on the row.
- The notes name what the misses looked like: Marcus wrote the perfect square itself (16) where its square root (4) belonged. A score alone would not have said that.
- Criterion was met on probes 10, 11 and 12 (7, 7, 7): three in a row at 7 of 8 or better.

The progress report sentence this log produces

On weekly simplifying radicals probes (8 problems), Marcus scored 3 of 8 at baseline and 7, 7 and 7 of 8 on the last three probes, meeting the criterion of 7 of 8 on 3 consecutive probes.

PREVIEW