North Dakota Grade 3 to Grade 4 Engineering Design Summer Bridge

Engineering Design: Review and Readiness

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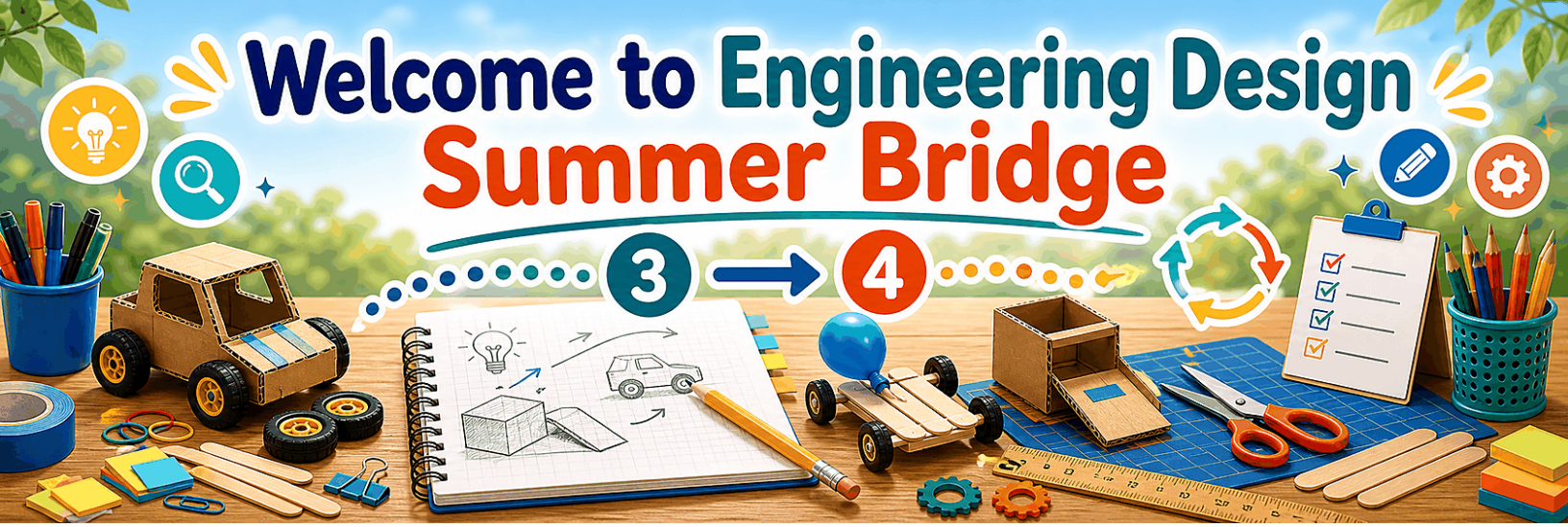


A Grade 3 to Grade 4 engineering design path: review, preview, and grow.

This bridge book reviews Grade 3 design thinking and gently previews the next step. Students revisit familiar ideas first, then move toward clearer problem statements, stronger comparisons, and more careful testing habits for Grade 4.

Grade 3 review

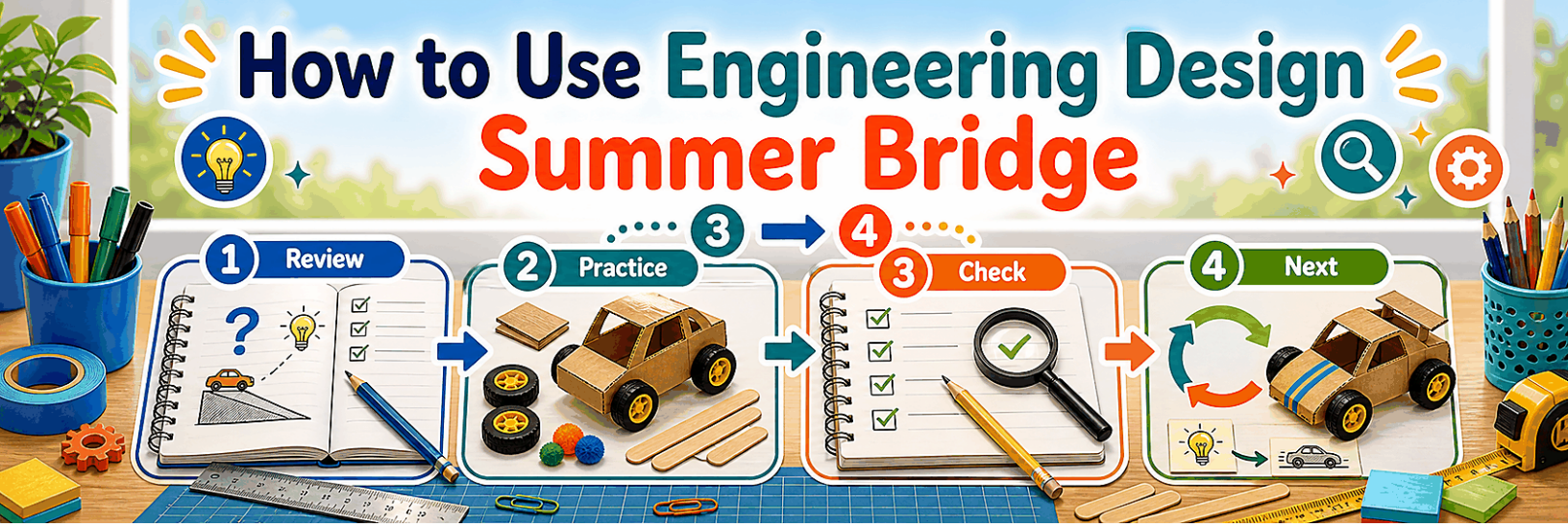
- define a simple design problem
- list criteria and constraints
- compare more than one solution
- plan fair tests for designs
- use failure points to improve

Grade 4 readiness

- make problem statements more exact
- connect research to new ideas
- use decision tables with evidence
- test like an engineer
- explain the next improvement step

A growth path, one step at a time

The first weeks strengthen Grade 3 skills. Later weeks add gentle Grade 4 previews. The goal is not to rush ahead; it is to help students see how the same design process becomes more careful and more evidence-based.



Use the bridge pages as a guided move from review to readiness.

This book begins with Grade 3 design ideas and then previews how students will use those ideas with more independence. Students should expect review pages first and gentle Grade 4 readiness pages later.

Review days	Read the short reminder and answer the questions. These pages rebuild the design words students need: problem, criteria, constraints, solution, test, and improvement.
Readiness days	Slow down and look for the new step. The page may ask students to make a problem more exact, compare with a table, or explain a fix from evidence.
Best pace	Plan for about 15–20 minutes. One careful page is enough for a summer day.
After checking	Treat missed answers as clues. Ask, "Was I defining, comparing, testing, or improving?" Then correct the work.

Review

Remember the Grade 3 design idea and the words that go with it.

Step Up

Try the readiness step, such as making a clearer statement or using stronger evidence.

Reflect

Ask what changed from Grade 3 review to Grade 4 readiness. Name the next design habit.

For students

When a page says Grade 4 preview, do not worry if it feels new. Use the same design steps you already know and add one careful detail.

For parents and teachers

Point out the growth step: clearer problem, better comparison, fairer test, or evidence-based fix. Keep support brief so the student still does the thinking.

My Science Bridge Progress

Check off Grade 3 review days, Grade 4 readiness days, and Friday quizzes.

5 review weeks | 3 readiness weeks | 8 Friday quizzes

This grade 3 to grade 4 science summer bridge belongs to: _____

Week	Focus	Mon	Tue	Wed	Thu	Friday Quiz
1	Defining Design Problems and Comparing Solutions	☐	☐	☐	☐	____ / 10
2	Comparing Solutions and Testing and Improving Mix	☐	☐	☐	☐	____ / 10
3	Defining Design Problems and Comparing Solutions	☐	☐	☐	☐	____ / 10
4	Testing and Improving and Defining Design Problems	☐	☐	☐	☐	____ / 10
5	Defining Design Problems and Comparing Solutions Mix	☐	☐	☐	☐	____ / 10
6	Grade 3 Review and Grade 4 Preview	☐	☐	☐	☐	____ / 10
7	Grade 4 Preview: Generating and Comparing Solutions and Fair Tests and Failure Points	☐	☐	☐	☐	____ / 10
8	Grade 4 Preview: Defining Design Problems and Generating and Comparing Solutions	☐	☐	☐	☐	____ / 10

Reflection Notes

A design idea that feels strong: _____

A design idea to practice again: _____

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Here's what we'll explore together!

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Let's learn and have fun!

WEEK

1

Defining Design Problems and Comparing Solutions

Practice this week's science ideas.

This Week's Days

Day 1	Problems, Needs, and Wants
Day 2	Criteria and Constraints
Day 3	Define Your Own Problem
Day 4	More Than One Way
Day 5	Week 1 Quiz

Answer Key & Explanations

Check the answer first, then read the explanation to see the evidence or reasoning.

Week 1 Day 1: Problems, Needs, and Wants

Answers

1. Important ideas include engineering as solving problems by designing objects, tools, processes, or systems.
2. Accept two accurate review details, such as one fact about problem and one example, model, or evidence source from the lesson.
3. problem
4. Use a picture, table, graph, model, observation, or source fact from the lesson.
5. It helps explain Defining Design Problems.
6. a fact, observation, data point, or model from the lesson

Explanations

1. Start with the lesson's core idea. The review explains that Important ideas include engineering as solving problems by designing objects, tools, processes, or systems.
2. Good details come straight from the review bullets, not from a guess. Use two facts that help explain the lesson idea.
3. The word problem names one of the important science ideas in this lesson. Use it when you explain your answer.
4. Evidence can be an observation, a table, a graph, a model, or a source fact. It must connect directly to the claim.
5. The topic is one part of the larger chapter idea, Defining Design Problems. Connecting the day to the chapter helps you see the pattern across lessons.
6. Science answers are stronger when they name the evidence. The evidence shows why the claim should be trusted.

Week 1 Day 2: Criteria and Constraints

Answers

1. The two lists every defined problem needs.
2. Accept two accurate review details, such as one fact about pro model, or evidence source from the lesson.
3. problem
4. Use a picture, table, graph, model, observation, or source fact from the lesson.

5 It helps explain Defining Design Problems.

6 a fact, observation, data point, or model from the lesson

Explanations

1 Start with the lesson's core idea. The review explains that The two lists every defined problem needs.

2 Good details come straight from the review bullets, not from a guess. Use two facts that help explain the lesson idea.

3 The word problem names one of the important science ideas in this lesson. Use it when you explain your answer.

4 Evidence can be an observation, a table, a graph, a model, or a source fact. It must connect directly to the claim.

5 The topic is one part of the larger chapter idea, Defining Design Problems. Connecting the day to the chapter helps you see the pattern across lessons.

6 Science answers are stronger when they name the evidence. The evidence shows why the claim should be trusted.

Week 1 Day 3: Define Your Own Problem

Answers

1 Define a simple design problem with criteria and constraints.

2 Accept two accurate review details, such as one fact about problem and one example, model, or evidence source from the lesson.

3 problem

4 Use a picture, table, graph, model, observation, or source fact from the lesson.

5 It helps explain Defining Design Problems.

6 a fact, observation, data point, or model from the lesson

Explanations

1 Start with the lesson's core idea. The review explains that Define a simple design problem with criteria and constraints.

2 Good details come straight from the review bullets, not from a guess. Use two facts that help explain the lesson idea.

3 The word problem names one of the important science ideas in this lesson. Use it when you explain your answer.

4 Evidence can be an observation, a table, a graph, a model, or a source fact. It must connect directly to the claim.

5 The topic is one part of the larger chapter idea, Defining Design Problems. Connecting the day to the chapter helps you see the pattern across lessons.

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Week 1 Day 4: More Than One Way

Answers

1 Good designers never stop at one idea.

2 Accept two accurate review details, such as one fact about proble model, or evidence source from the lesson.

3 problem

4 Use a picture, table, graph, model, observation, or source fact from the lesson.

5 It helps explain Comparing Solutions.

6 a fact, observation, data point, or model from the lesson

Explanations

1 Start with the lesson's core idea. The review explains that Good designers never stop at one idea.

2 Good details come straight from the review bullets, not from a guess. Use two facts that help explain the lesson idea.

3 The word problem names one of the important science ideas in this lesson. Use it when you explain your answer.

4 Evidence can be an observation, a table, a graph, a model, or a source fact. It must connect directly to the claim.

5 The topic is one part of the larger chapter idea, Comparing Solutions. Connecting the day to the chapter helps you see the pattern across lessons.

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