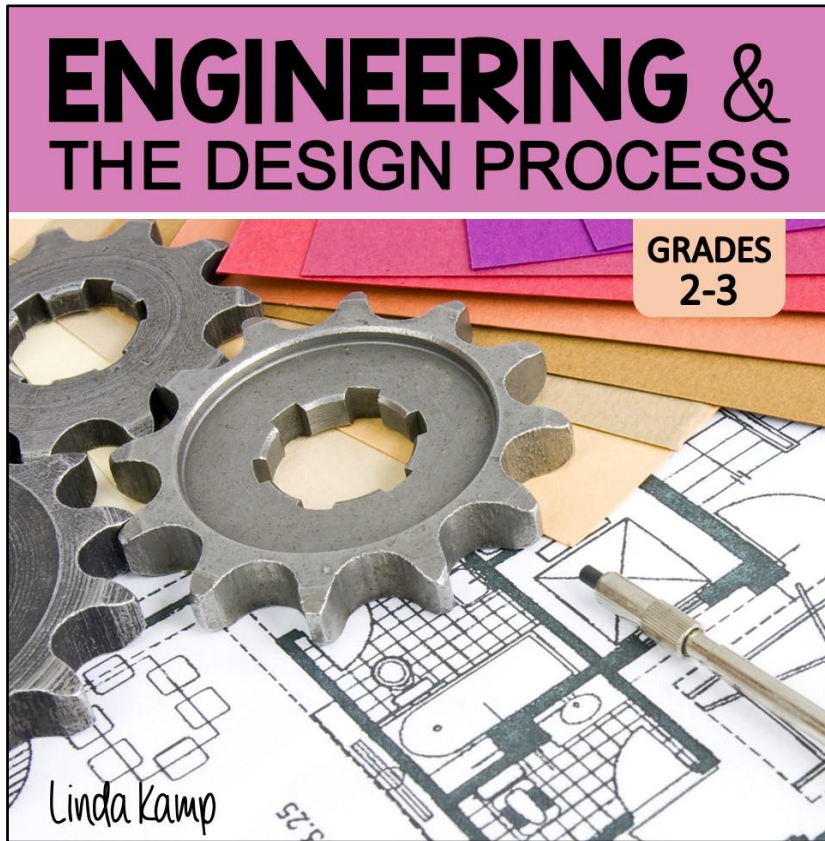


# INCLUDED IN THIS BUNDLE:



+

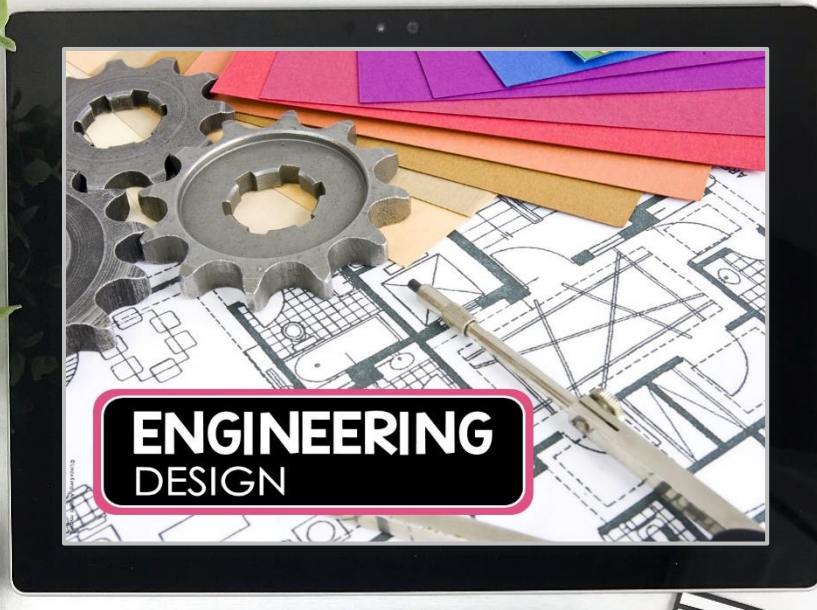


This bundle includes the complete printable Engineering Design NGSS unit

AND the digital Engineering Design add-on unit with narrated teaching slides and student activities on Google Slides

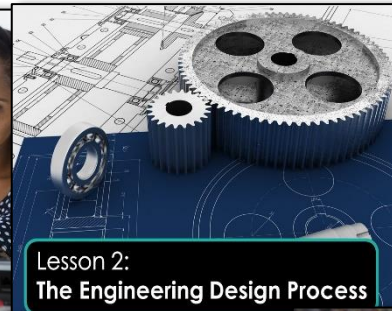
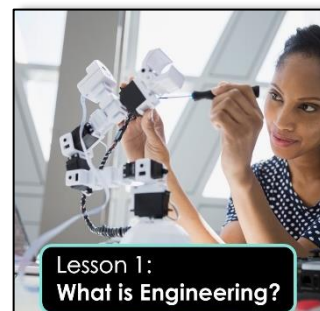
**THE FOLLOWING SLIDES SHOW WHAT IS INCLUDED IN EACH UNIT**

# TEACHING POWERPOINT



## 6 ENGAGING LESSONS

- What is Engineering?
- The Engineering Design Process
- What is Technology?
- Natural & Man-Made Materials
- Engineering Inspired By Nature
- Designing Solutions



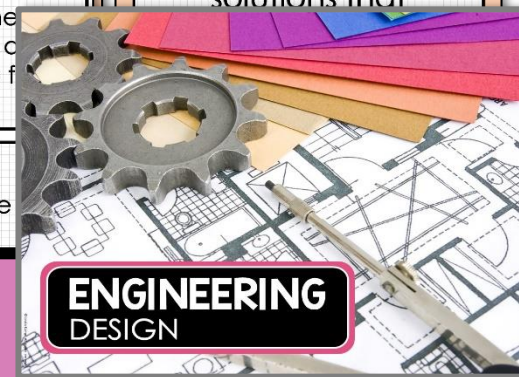
# EACH LESSON INCLUDES:

- Detailed, scripted lesson plan
- Engaging PowerPoint lesson
- Engineering Journal activity
- Related lab investigation
- Exit ticket quiz in 2 formats
- Vocabulary cards & posters
- Objectives display cards
- Turn & talk partner questions
- Related video links
- Center activity

The collage features several overlapping educational documents:

- Lesson 1: What is Engineering?** (TEACHER GUIDE) with objectives, materials, and a guiding question: "What do engineers do?"
- Investigation 3: Evaluate A Design** (TEACHER GUIDE) with a question: "How do materials and shape make a design better?"
- Lesson 1: Quick Check** with a writing prompt: "Write the answer to each question."
- Investigation 1: Make a Blueprint** (TEACHER GUIDE) with an objective: "Can you make a blueprint of an object?"
- Lesson 1: INVESTIGATE: Make a Blueprint** with a question: "How can you make a blueprint of an object in your classroom?"
- LESSON 1 JOURNAL: Write About It** with a prompt: "Complete Lesson 1 in your science journal."
- Lesson 2: TALK ABOUT IT** with a prompt: "Talk with your partner and compare a blueprint to a scientific drawing. How are they the same and different?"
- Lesson 3: TALK ABOUT IT** with a prompt: "I can explain how people use technology."
- ESSENTIAL QUESTION: ENGINEERING DESIGN** - "How do engineers..."
- BIG IDEA: ENGINEERING DESIGN** - "Engineers design solutions that..."
- What is technology?** - "Technology makes..."
- What is engineering?** - "Engineering is the process of creating a solution to solve a problem. The people who do this are called engineers."
- What is biomimicry?** - "'Bio' means life and 'mimicry' means to imitate. Biomimicry..."
- The Engineering Design Process** - "There are 5 key steps in the design process. Engineers use these steps."
- How can technology keep people safe?** - "Some technology is..."
- There are many kinds of engineers.** - "There are many types of engineers. They study and work in all areas of life. Each kind of engineer has special training and knowledge in their field."
- How do we use technology at school?**
- What does an engine...**
- What is an Engineer?** (4:29) - Video link.
- What is engineering?**
- How do we use technology at school?**
- What technology do you have in your classroom? How does it help you learn?**
- What is the engineering design process?** - "The engineering design process is a series of steps."
- Engines use science, math, technology, and imagination to solve problems. They may design new things or improve an existing product.**

# SAMPLE LESSON



**ENGINEERING DESIGN**

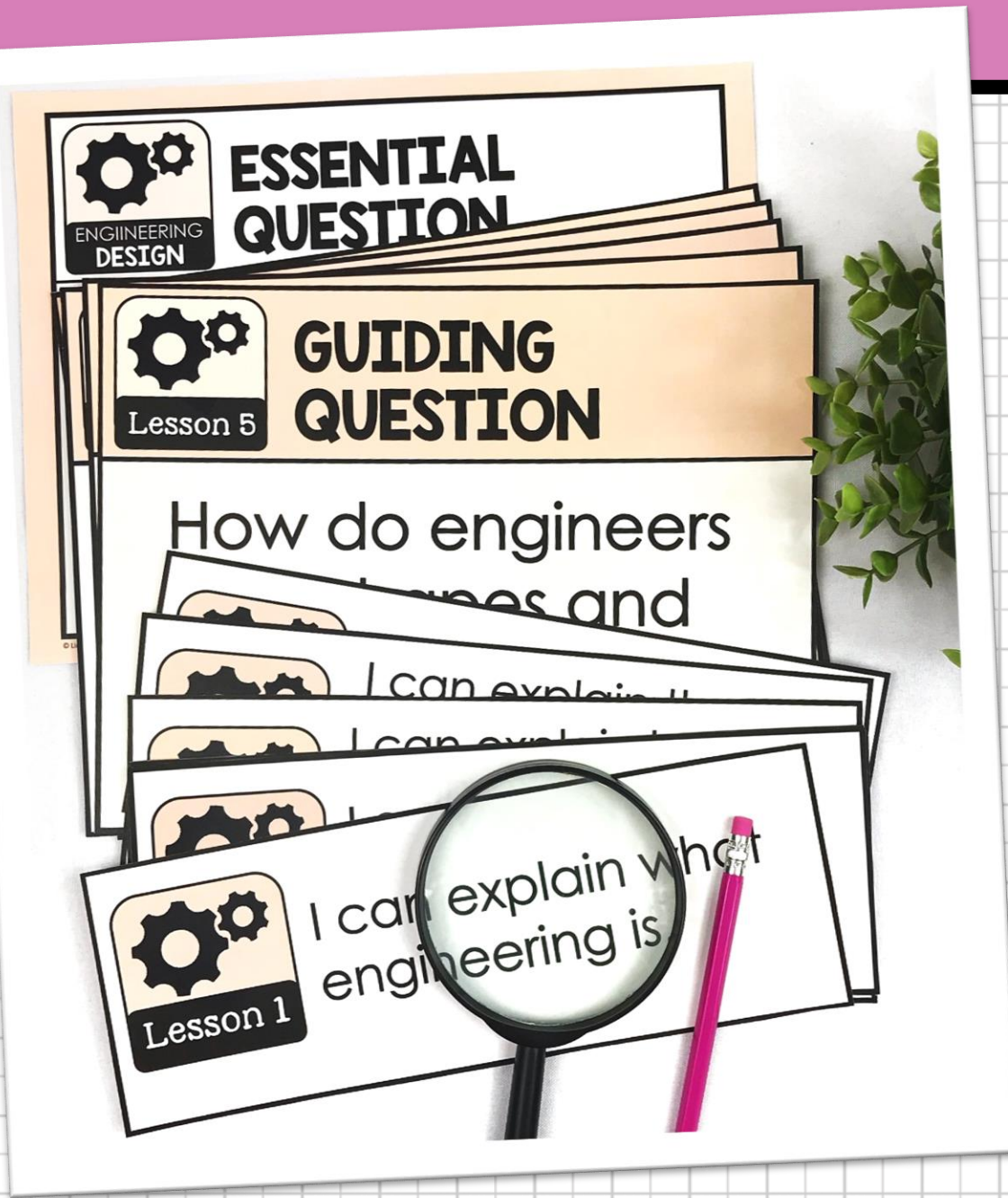
# TEACHER GUIDE

- Scripted lesson plans
- Lesson objectives
- Performance tasks
- Pacing Guide
- Management tips
- Standards alignment
- Extension activities
- Assessment & quizzes

The collage features several overlapping documents:

- Meet An Engineer:** A profile of Dr. Jamila, an environmental engineer, with a photo and text about her work on Christmas Island.
- Natural or Man-Made?:** A worksheet with icons of a milk carton, t-shirt, laptop, wind turbine, and pencils, asking students to identify natural (N) or man-made (M) materials.
- ENGINEERING DESIGN UNIT TEST:** A test page with a 'Vocabulary Match' section and a question about a detailed plan of how something will be made.
- Investigation 5 Biomimicry: Build a Model:** A lesson plan with a 'QUESTION' about modeling biomimicry, an 'OBJECTIVE' for students to build a model, and 'MATERIALS' for students.
- Investigation 6 Design A Wildlife Crossing:** A lesson plan with a 'QUESTION' about wildlife crossings, an 'OBJECTIVE' for students to design a solution, and 'MATERIALS' for building models.
- Investigation 2 Make a Design Manual:** A lesson plan with a 'QUESTION' about the design process, a 'PROCEDURE' for reviewing lessons, and 'MATERIALS' including building materials and videos.
- Investigation 1 Make a Blueprint:** A lesson plan with a 'QUESTION' about making a blueprint, 'MATERIALS' for drawing, and 'PROCEDURE' for discussing ideas and creating a blueprint.
- ENGINEERING DESIGN The Engineering Design Process:** A lesson plan with an 'OBJECTIVE' to explain the design process, a 'GUIDING QUESTION' about how engineers design, and a 'LESSON' with 7 steps.
- ENGINEERING DESIGN Make a Blueprint:** A lesson plan with a 'QUESTION' about making a blueprint, 'MATERIALS' for drawing, and 'PROCEDURE' for discussing ideas and creating a blueprint.
- ENGINEERING DESIGN Unit Pacing:** A document showing a 3-day pacing schedule for each lesson, with 2 days for teaching and 1 day for student response.
- Next Generation Science Standards Alignment:** A document detailing science and engineering practices, such as asking questions and developing models.
- ENGINEERING DESIGN Book List:** A list of books including 'How Things Work', 'Simple Machines', 'The Greatest Inventions', and 'Plant & Animal Needs Life Cycles'.
- ENGINEERING DESIGN Videos:** A list of video resources for lessons 1 and 2, including 'How Do Seeds Become Plants?' and 'Plant Life Cycle'.
- ENGINEERING DESIGN Unit Materials:** A list of materials needed for investigations, including white and blue/black construction paper, crayons, rulers, scissors, student photos, and building materials.

# DETAILED LESSON PLANS

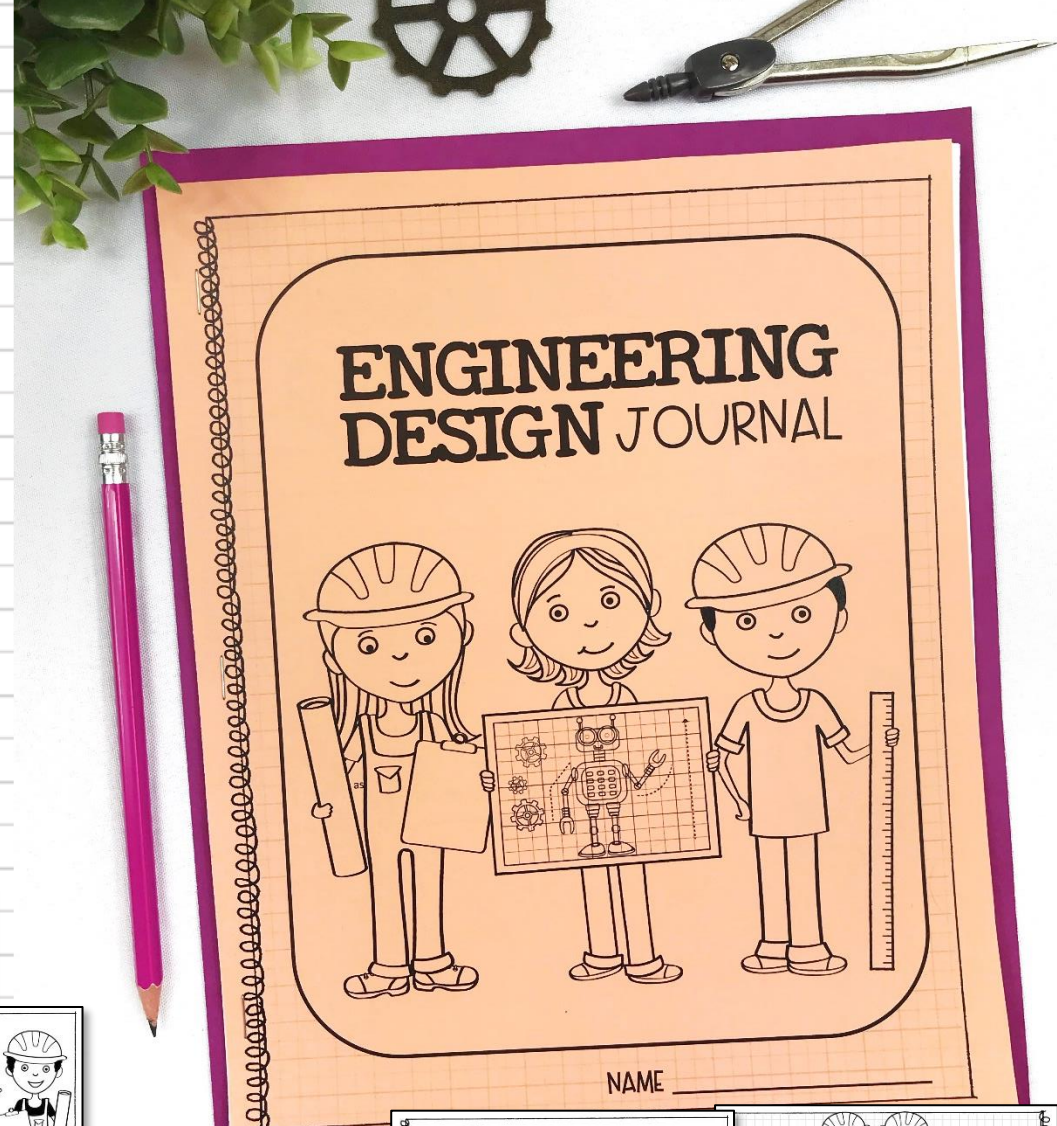


Aligned to  
Next Generation  
Science Standards,  
TEKS,  
and  
Common Core State  
Standards  
for 2<sup>nd</sup> Grade

STANDARDS-BASED

# Journal activities include:

- Applying vocabulary
- Short written response
- Writing to explain
- Labeling diagrams



**ENGINEERING DESIGN JOURNAL**

NAME \_\_\_\_\_

**Lesson 1 What is engineering?**

What are some kinds of engineers?

How do engineers improve people's lives?

Put a ✓ next to things an engineer might design.

machines      special shoes

**Lesson 2 The Design Process**

What is the engineering design process?

Glue the steps to the design process in the correct order. Use your bookmark to help you.

1	2	3
4	5	6

**Lesson 3 What is technology?**

What is technology?

Is all technology electronic?

yes     no

Explain some ways people use technology every day.

**Lesson 4 Natural & Man-made Materials**

Write the names of these natural materials.

What man-made objects do you see in the picture below?

**Lesson 5 Inspired by Nature**

Engineers observe nature. They look at special features animals have that help them. Engineers think about how they can use these features to help solve a problem.

Circle the pictures of technology.

**Lesson 6 Design a Solution**

Brainstorm a list of ideas for a crab or a fish. Write all your ideas no matter how wild.

**DESIGN PROCESS**

- ASK
- IMAGINE
- PLAN
- CREATE
- IMPROVE

**Lesson 5 Inspired by Nature**

What is biomimicry?

Many inventions are inspired by nature. What animals inspired these inventions?

**Lesson 4 Natural & Man-made Materials**

What are natural materials?

**Engineering Vocabulary**

engineering	needs
solution	improve
design	materials
blueprint	natural
prototype	man-made
diagram	biomimicry
design process	technology

Write any new words you learn.

# LESSON RESPONSE JOURNAL

# HIGH-ENGAGEMENT LESSONS

Students discuss, write & investigate

**LESSON 6 TALK ABOUT IT** Designing Solutions

Talk with your partner about wildlife crossings you have seen.

What technology could you use to protect wild animals as they cross a



**LESSON 4 TALK ABOUT IT** Natural or Man-Made?

Tell your partner the difference between natural and man-made materials.

Make a list of the materials needed to



**LESSON 3 TALK ABOUT IT** What is technology?


Talk with your partner about the different technology people have in their homes.

What technology does your family use at home?

**LESSON 3 INVESTIGATE** Analyze a Design

**QUESTION:** How does the shape and material of an object help it to work?

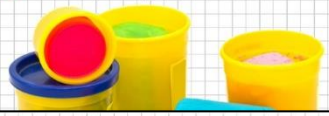
Think about the design



**LESSON 5 INVESTIGATE** Build a Prototype

**QUESTION:** How can you make a prototype of an object inspired by nature?

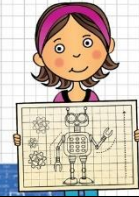
Use clay to make a prototype of a



**LESSON 1 INVESTIGATE** Make a Blueprint


**QUESTION:** How can you make a blueprint of an object in your classroom?

Draw a detailed diagram that includes measurements of an object in your classroom.



**LESSON 2 INVESTIGATE** Create a Design Manual


**QUESTION:** How do engineers use the design process to solve



**LESSON 5 TALK ABOUT IT** What is Biomimicry?

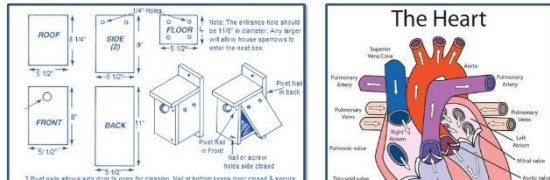
Talk with your partner about what biomimicry is.

Can you think of another example of biomimicry?



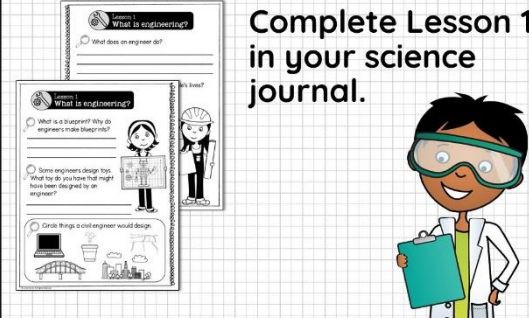
**LESSON 1 TALK ABOUT IT** What is engineering?

Talk with your partner and compare a blueprint to a scientific drawing. How are they the same and different?



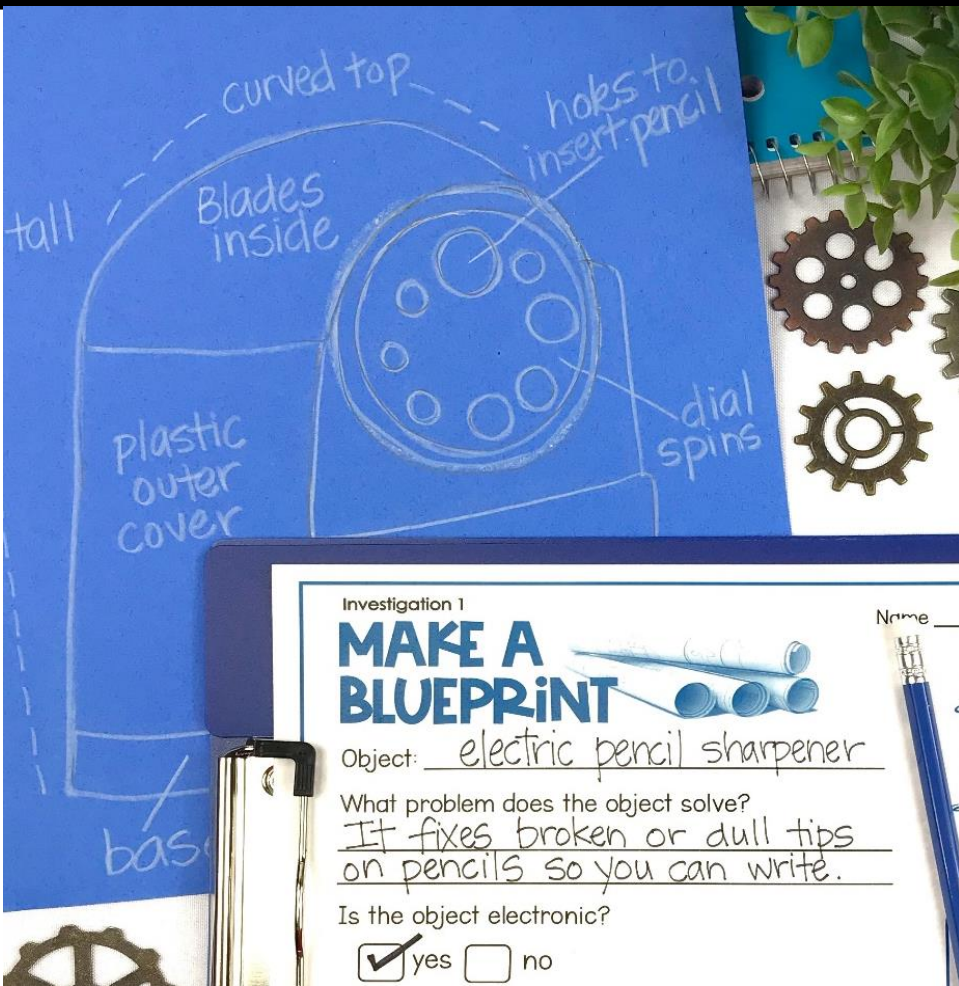
**LESSON 1 JOURNAL** Write About It

Complete Lesson 1 in your science journal.

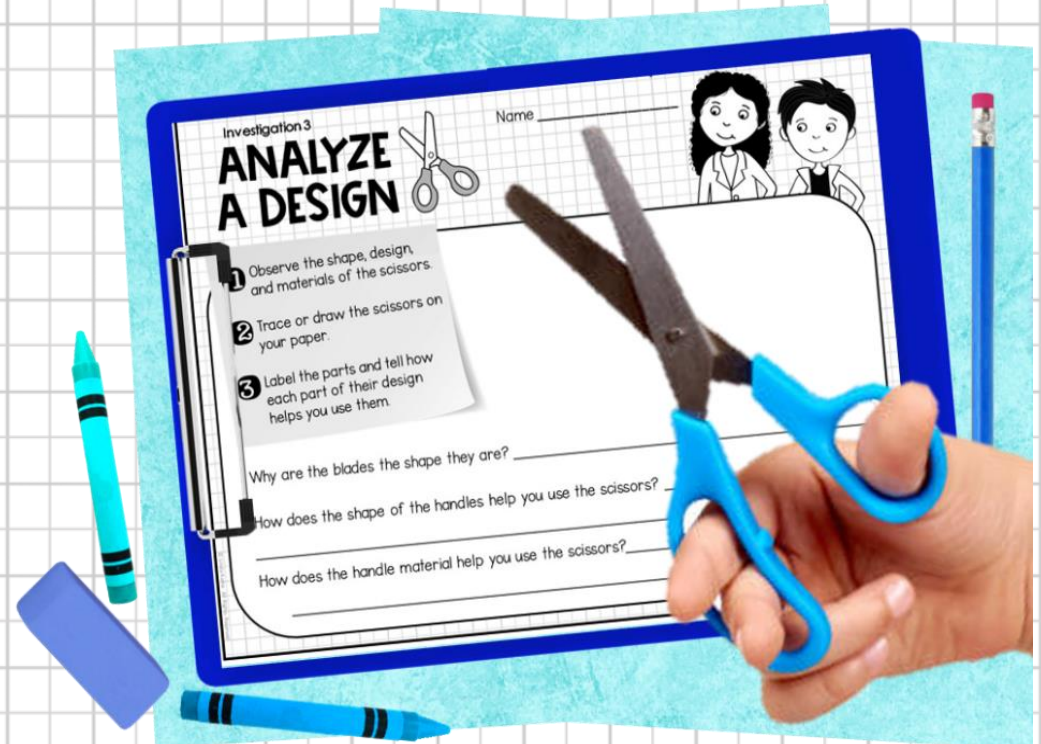


# 6 HANDS-ON ENGINEERING LABS

Each lab builds on the previous one as students gain knowledge of engineering practices



and learn the steps of the design process





# CULMINATING DESIGN PROJECT

## Meet An Engineer

Hello! My name is Dr. Jamila. I am an environmental engineer. I work to protect wildlife and preserve natural habitats on Christmas Island.

Here on the island, I study the migratory paths of animals. Currently, I am working on a solution to help red crabs safely cross busy roads and railways as they migrate to the ocean to lay their eggs.

Would you like to help me?



Students apply the steps of the design process in a culminating project



## LESSON 6 INVESTIGATE

## Design a Crab Crossing

### QUESTION:

What solution can you design to protect red crabs as they migrate to the ocean?

Use the steps of the engineering design process to help Dr. Jamila design a solution.



**PLAN** Draw a diagram of your design idea. Write the steps you will take.

**DESIGN A SAFE WILDLIFE CROSSING**

Name \_\_\_\_\_ Investigation 6

**ASK**  
What is the problem?  
\_\_\_\_\_  
\_\_\_\_\_

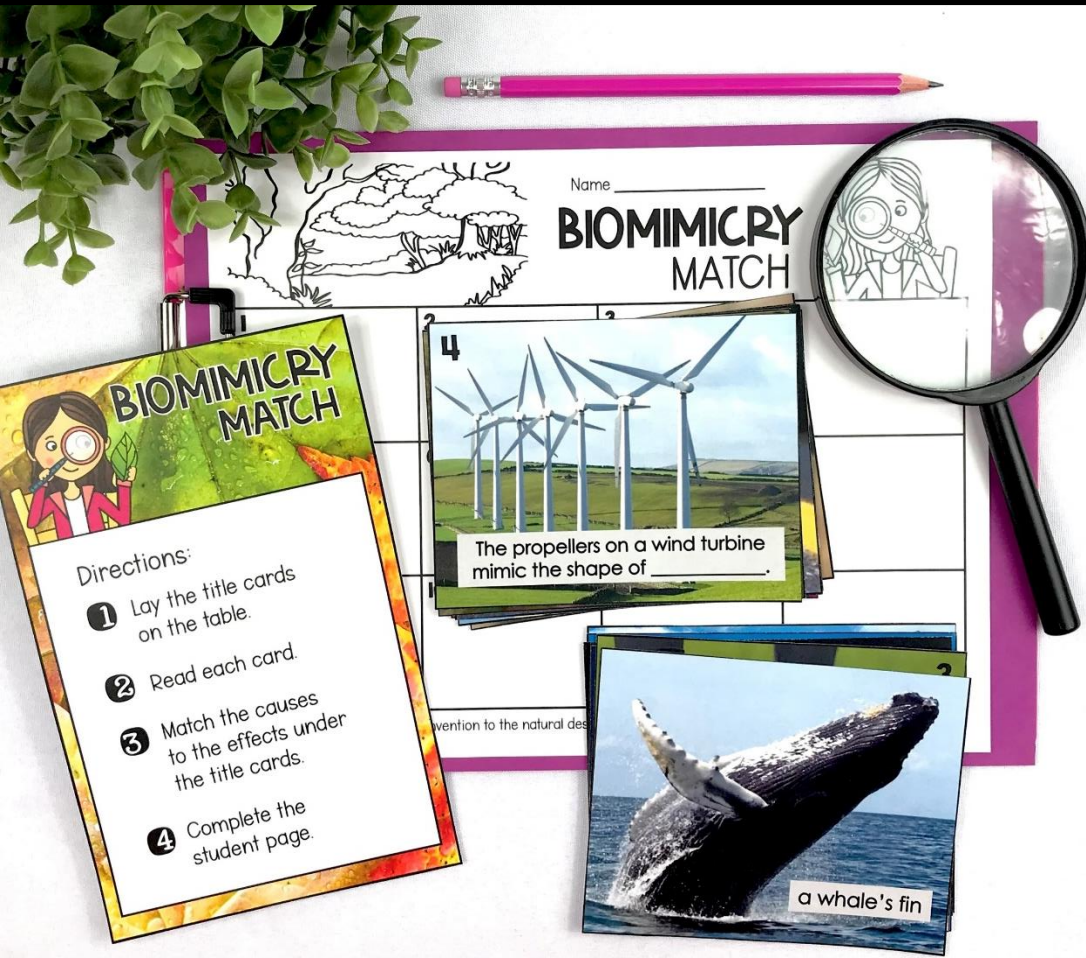
**IMPROVE**  
How could you improve your design?  
\_\_\_\_\_  
\_\_\_\_\_

**IMAGINE**  
Brainstorm a list of ideas for solving the problem.  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

What materials can you use?  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

# EXTENSION ACTIVITIES

Reinforce  
**CONTENT**



Practice  
**LITERACY SKILLS**



# FOCUS WALL RESOURCES

**ESSENTIAL QUESTION**  
ENGINEERING DESIGN

**GUIDING QUESTION**  
Lesson 5

How do engineers use shapes and patterns found in nature?

Engineering Design

Focus Wall Cards



Vocabulary Cards

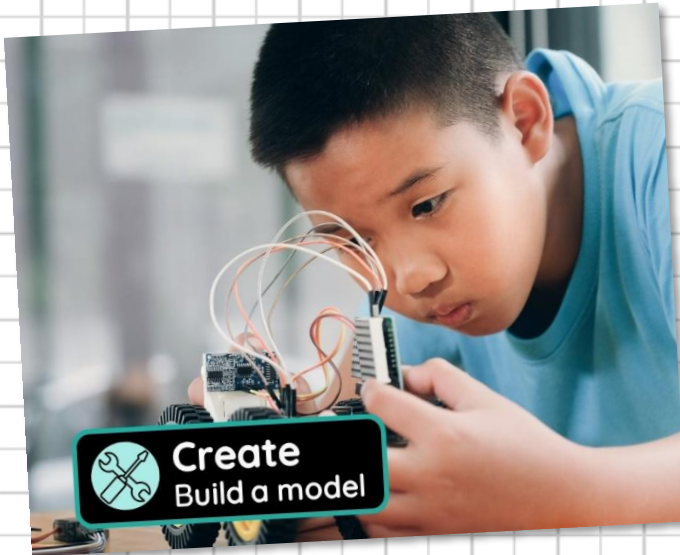
Solution  
technology  
man-made  
natural

**design process**  
A series of steps engineers use to find solutions to problems  
Lesson 2

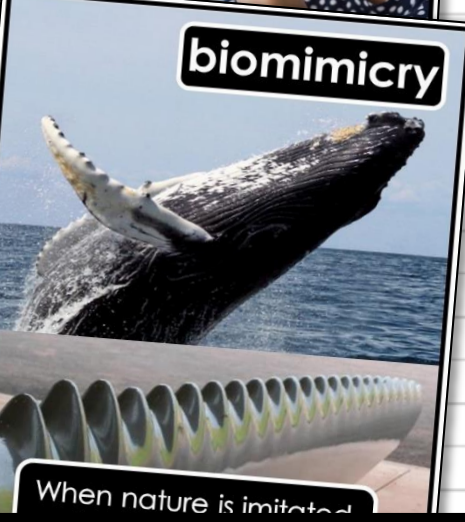
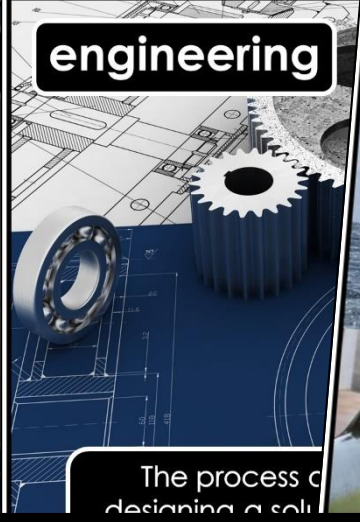
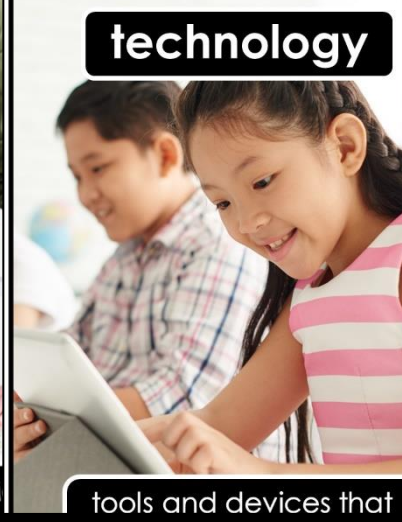
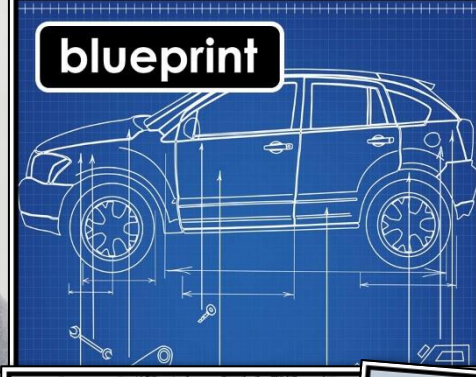
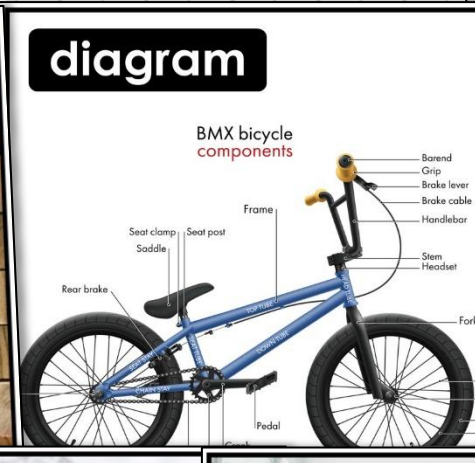
**Lesson 1** I can explain what engineering is.

Objectives Cards

# FULL PAGE POSTERS

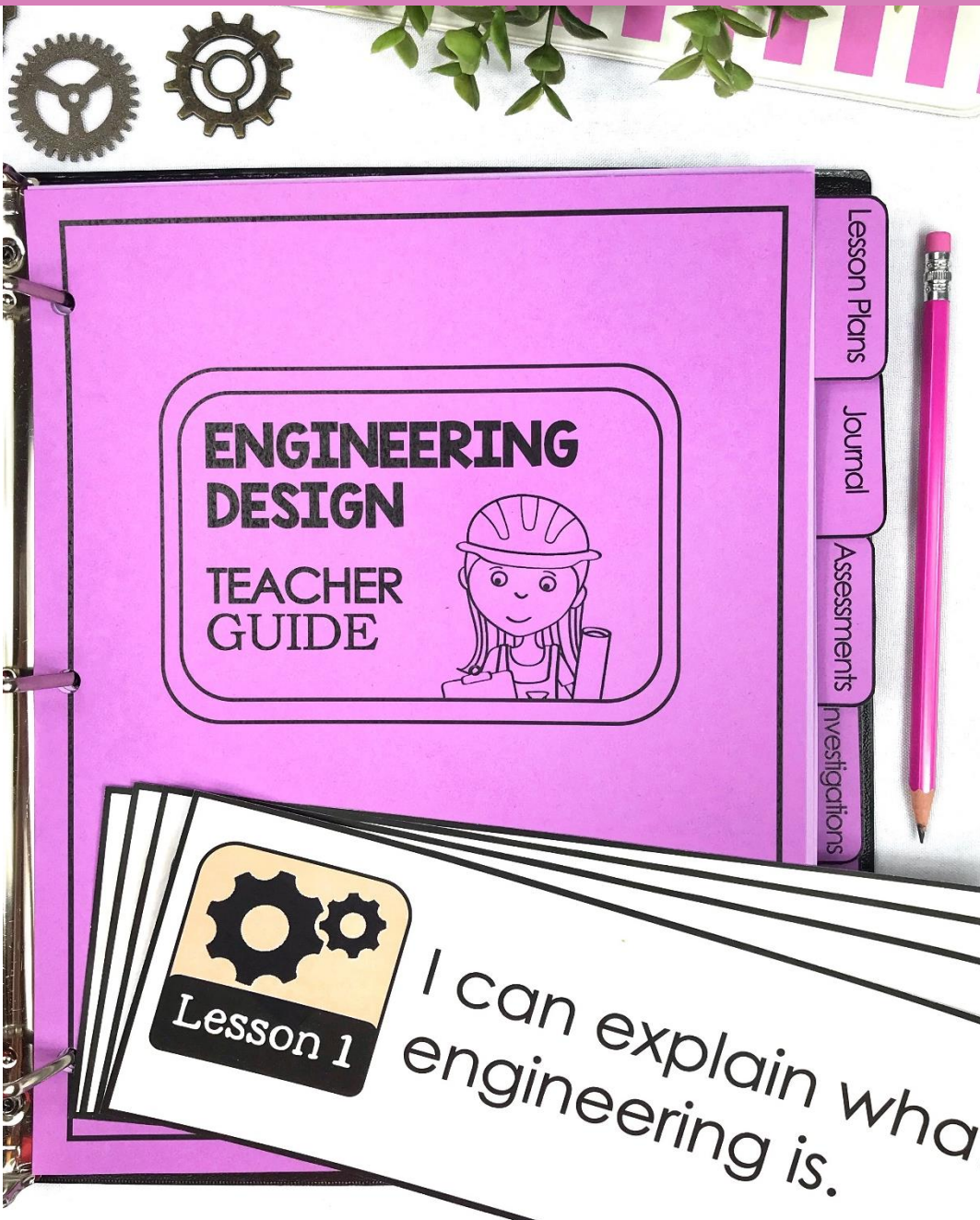


# Engineering Design Process



# Vocabulary Posters

# UNIT PLANNING BINDER



Organize the resources in a handy planning binder

- cover & spines
- section dividers
- divider tabs

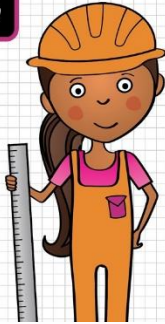
**PLAN TEACH ASSESS**

an in-depth  
and effective unit

# BONUS Bulletin Board Set

## ASK *Identify the Problem*

- What is the problem?
- What are the rules or requirements?
- How would someone else solve it?



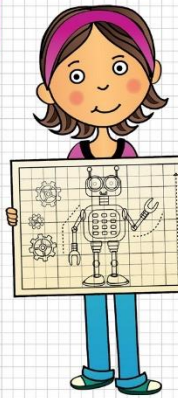
## IMAGINE *Brainstorm ideas*

- Brainstorm ideas and solutions.
- Make a list of your ideas.



## PLAN *Draw a design*

- Draw a diagram.
- What materials will you need?
- Write down the steps you will take.



## CREATE *Follow your plan*

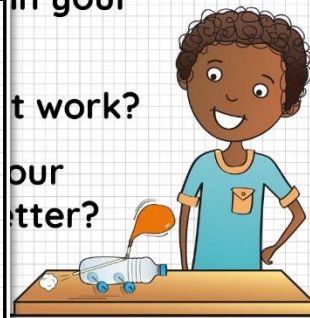
- Follow your plan to build your design.
- Test your design.
- Does it work the way you intended?



## IMPROVE *Make it better*

What works in your design?

What doesn't work?  
How can you improve your design?

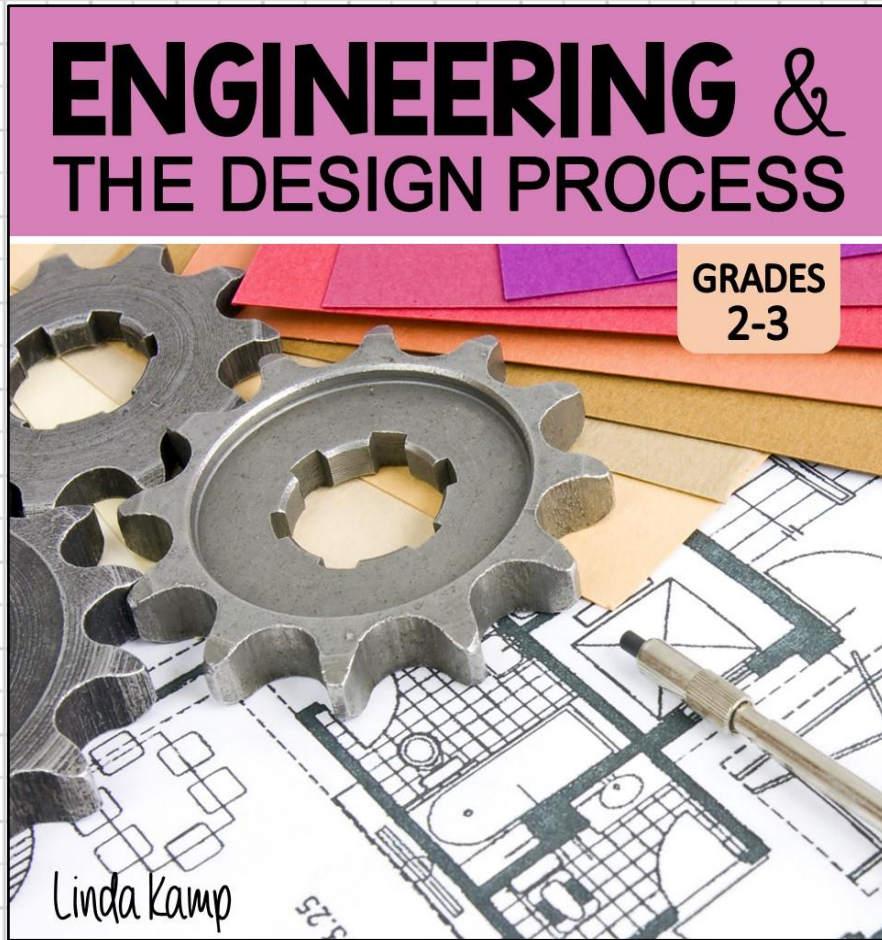


## PRESENT *Show others*

- Share your design with others.
- Explain its parts.
- Share how it solves a problem.



Title letters, decorative elements & posters



## Students gain an understanding of:

- Engineering practices
- Types of engineers
- Engineering design process
- Drawing diagrams
- Building models
- Natural & man-made materials
- Biomimicry
- Technology in engineering
- Designing a solution
- Testing & evaluating a design



# THE DIGITAL UNIT INCLUDES:

LISTEN & LEARN

## 6 AUDIO NARRATED LESSONS

Narrated slides enable independent learning

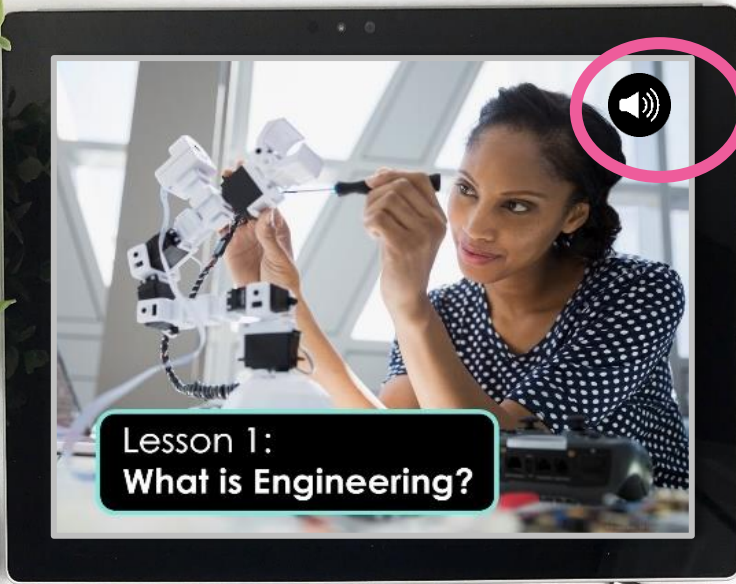
- What is Engineering?
- The Engineering Design Process
- What is Technology?
- Natural & Man-Made Materials
- Engineering Inspired By Nature
- Designing Solutions



**ENGINEERING  
DESIGN**

# EACH LESSON INCLUDES:


- Narrated lesson slides
- Science journal activity slides
- Exit tickets in 2 formats
- Turn & talk partner questions
- Interactive center activity




A collage of various lesson activity slides including:

- Natural objects**: Some natural materials come from living things. Sweaters and socks can be made from wool.
- How do we use technology at school?**
- How can technology keep people safe?**: Some technology is designed to keep us safe. Bike helmets are designed...
- There are many kinds of engineers.**: There are many types of engineers. They study and work in all areas of life. Each kind of engineer has special...
- What is technology?**: Technology makes people's lives easier. It can help us do things...
- What is biomimicry?**: "Bio" means life and "mimicry" means to imitate. Biomimicry means to imitate life or nature. Engineers observe nature in action and use that knowledge to inspire new ideas. People...
- The Engineering Design Process**: There are 5 key steps in the design process.
- What is the engineering design process?**: The engineering design process is a series of steps...
- What is engineering?**: Engineering is the process of creating a solution to solve a problem. The people who do this are called engineers.
- LESSON 1 TALK ABOUT IT**: What is engineering? Talk with your partner and compare a blueprint to a scientific drawing. How are they the same and different?
- Imagine**: Brainstorm ideas. Think of ways to solve a problem. Be creative and think of solutions. Work as a team and share every idea. Think about how you can use your ideas.
- LESSON 1 JOURNAL Write About It**: Complete Lesson 1 in your science journal.


# LESSON RESPONSE ACTIVITIES

 **Lesson 4 Natural & Man-made Materials**



 What are natural materials?  
**Type here**

\_\_\_\_\_



\_\_\_\_\_


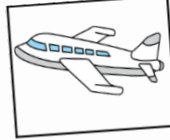
 Move the pictures to the correct space.

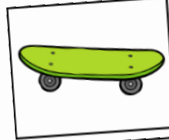

**Natural Objects**


 

**Man-made Objects**



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Interactive  
journal  
activities on  
Google Slides™  
for each lesson

with  
moveable  
pieces

# DIGITAL CENTER ACTIVITIES

## Reinforce SCIENCE CONTENT

The engineering design process is a series of \_\_\_\_\_ to guide engineers.



- A. workers
- B. blueprints
- C. steps
- D. people

## Practice MATH & LITERACY SKILLS

Environmental engineers track the life span of frogs and toads. Frogs can live up to 7 years. Toads can live up to 12 years. How much longer can toads live than frogs?



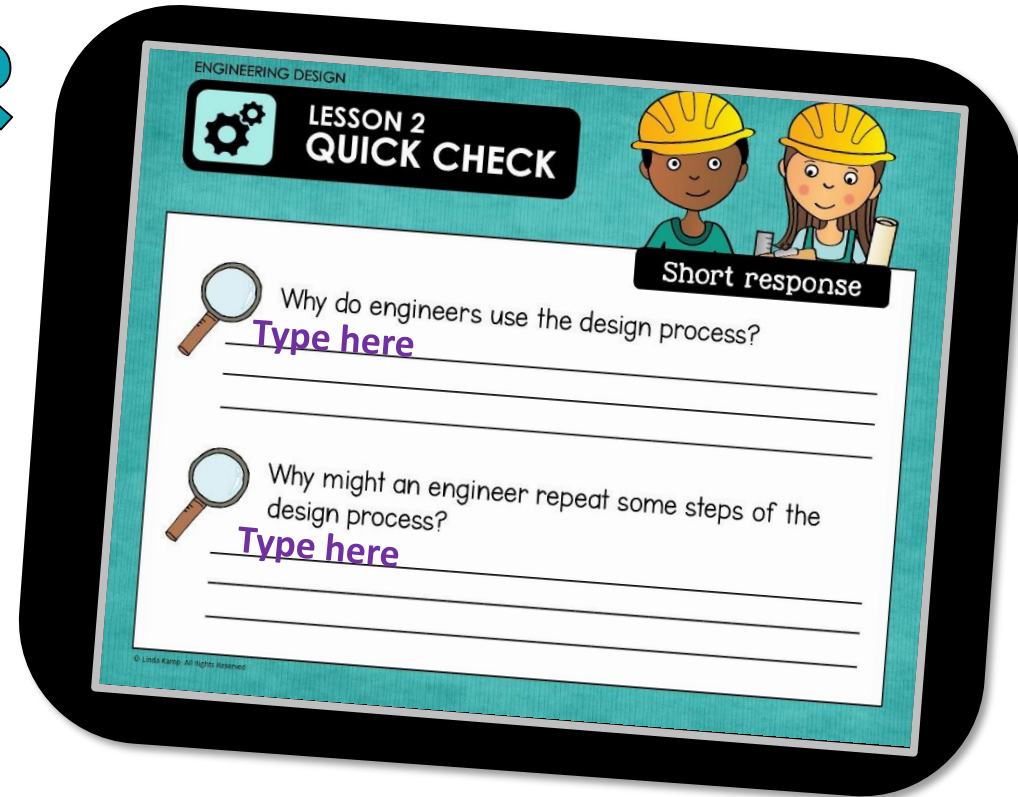
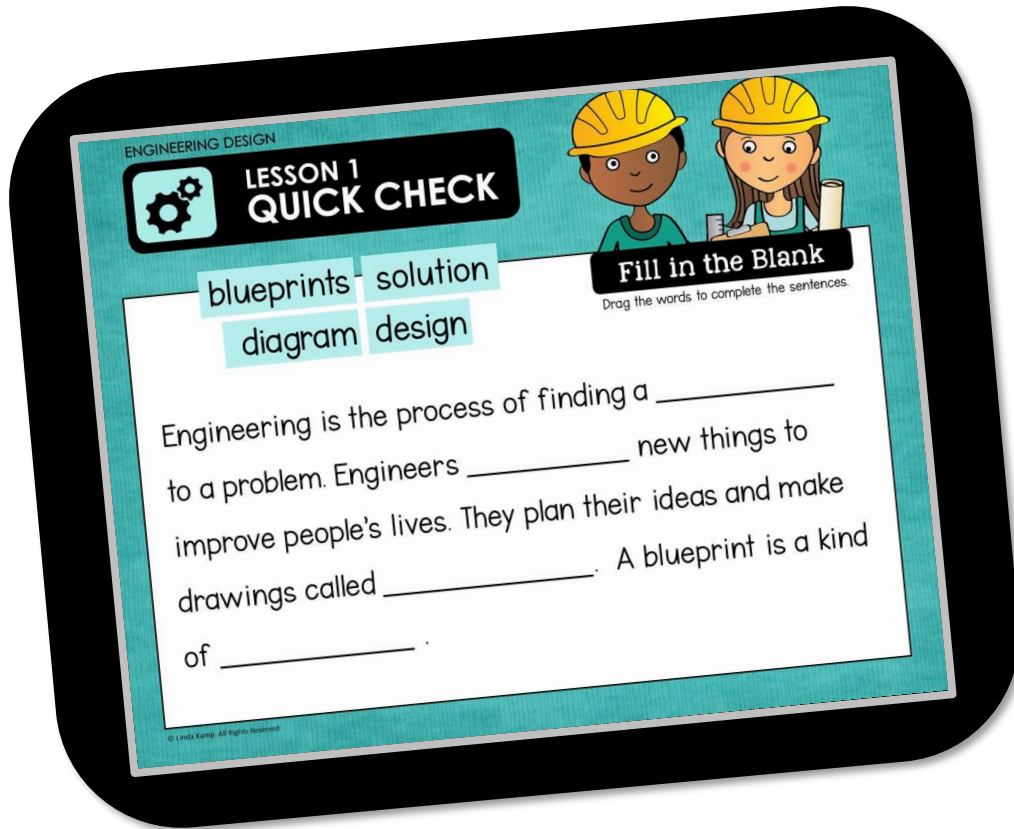
Check your answer

Practice games with  
moveable pieces

# ASSESSMENT MADE EASY

## TYPE YOUR ANSWER

Short response quizzes



## DRAG & DROP

Fill in the blank quizzes

Digital unit test & answer keys included

# Get a year of science planned for you

[CLICK HERE](#)

Second Grade NGSS  
**SCIENCE BUNDLE**

Science PROCESSES	Properties of MATTER	Habitats & ECOSYSTEMS	Earth Changes LANDFORMS	Plant & Animal LIFE CYCLES	Engineering DESIGN
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Linda Kamp  
YEARLONG CURRICULUM

[CLICK HERE](#)

*Digital* Second Grade NGSS  
**SCIENCE BUNDLE**

Science PROCESSES	Properties of MATTER	Habitats & ECOSYSTEMS	Earth Changes LANDFORMS	Plant & Animal LIFE CYCLES	Engineering DESIGN
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Linda Kamp  
YEARLONG DIGITAL UNITS

Units also available separately. See all unit [here](#)

<p><b>SCIENTISTS &amp; THE SCIENTIFIC METHOD</b> An Introduction to Science GRADES 2-3 Linda Kamp</p>	<p>States &amp; Properties of <b>MATTER</b> GRADE 2 Linda Kamp</p>	<p>Exploring Ecosystems &amp; <b>HABITATS</b> GRADE 2 Linda Kamp</p>	<p><b>LANDFORMS</b> GRADE 2 Earth's Changing Land &amp; Water Linda Kamp</p>	<p>Plant &amp; Animal Needs <b>LIFE CYCLES</b> GRADE 2 Linda Kamp</p>	<p><b>ENGINEERING &amp; THE DESIGN PROCESS</b> GRADES 2-3 Linda Kamp</p>
<p><b>SCIENTISTS &amp; THE SCIENTIFIC METHOD</b> GRADE 2-3 LISTEN &amp; LEARN Lesson 1: What is Science? DIGITAL LESSONS ON GOOGLE SLIDES™ Linda Kamp</p>	<p>States &amp; Properties of <b>MATTER</b> GRADE 2 LISTEN &amp; LEARN Properties of <b>MATTER</b> DIGITAL LESSONS ON GOOGLE SLIDES™ Linda Kamp</p>	<p>Exploring Ecosystems &amp; <b>HABITATS</b> GRADE 2 LISTEN &amp; LEARN <b>HABITATS</b> DIGITAL LESSONS ON GOOGLE SLIDES™ Linda Kamp</p>	<p><b>LANDFORMS</b> GRADE 2 LISTEN &amp; LEARN <b>LANDFORMS</b> DIGITAL LESSONS ON GOOGLE SLIDES™ Linda Kamp</p>	<p>Plant &amp; Animal Needs <b>LIFE CYCLES</b> GRADE 2 LISTEN &amp; LEARN <b>LIFE CYCLES</b> DIGITAL LESSONS ON GOOGLE SLIDES™ Linda Kamp</p>	<p><b>ENGINEERING &amp; The Engineering Design Process</b> GRADE 2-3 LISTEN &amp; LEARN <b>ENGINEERING DESIGN</b> DIGITAL LESSONS ON GOOGLE SLIDES™ Linda Kamp</p>