

A Complete 5E Science Unit with Lesson Plans

4TH GRADE

INFORMATION TECHNOLOGIES

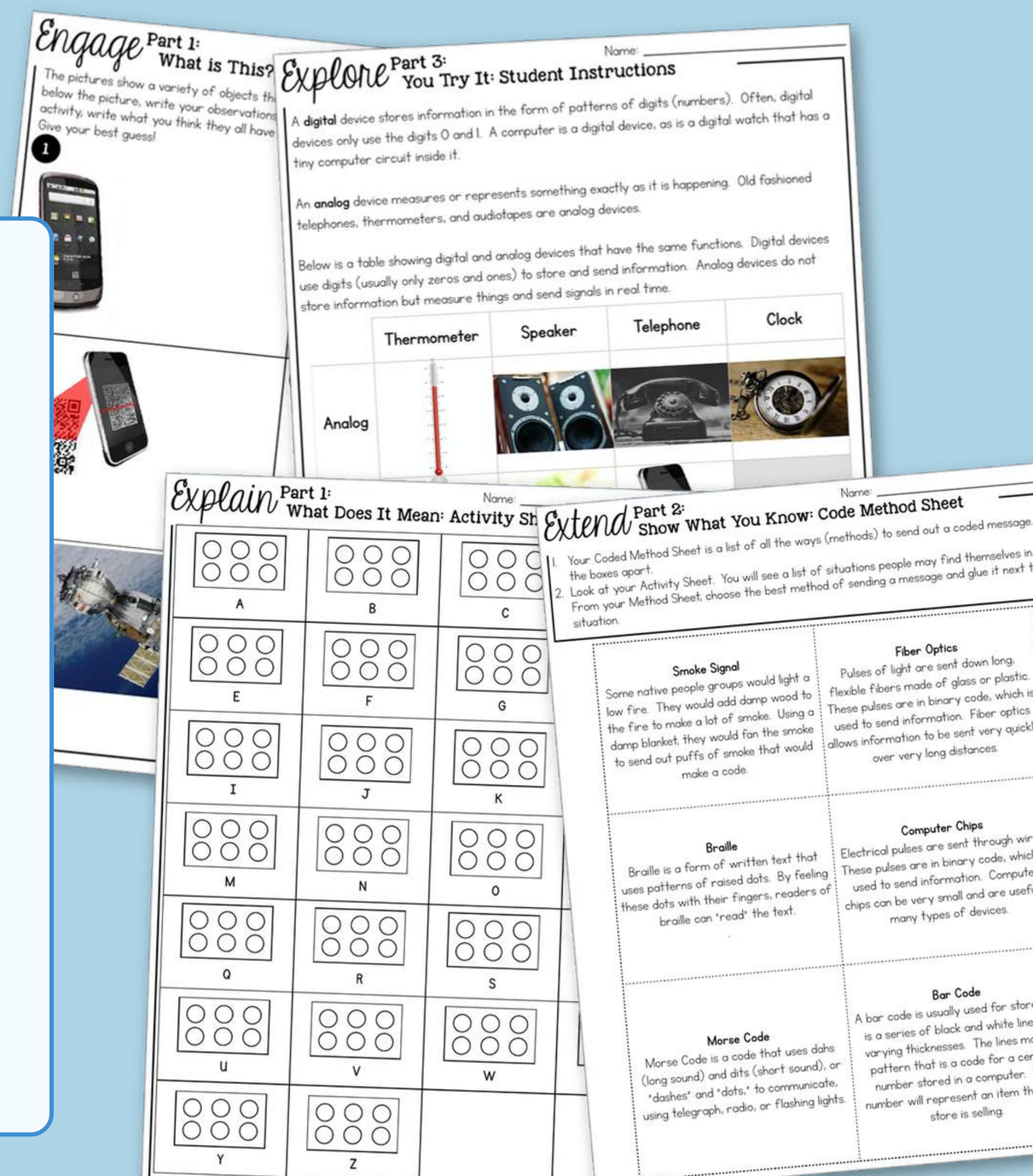
Engage, Explore, Explain, Extend, Evaluate
NGSS 4-PS4-3

KEEP SCROLLING TO SEE WHAT'S INSIDE!

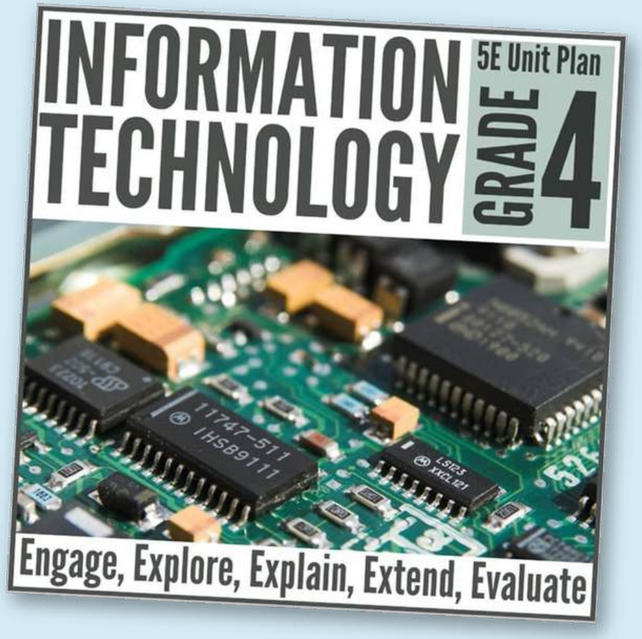
WHAT'S INCLUDED

5E INFORMATION TECHNOLOGIES UNIT

- 190+ Page 5E Unit Plan
- Lesson Plans for All 5 Phases
- Teacher Notes and Misconceptions
- Materials Checklist and 4 Timelines
- Hands-On Code and Technology Activities
- Reading Passages on Technology and Codes
- Vocabulary Cards and Big Idea Posters
- Exit Tickets in 3 Formats
- Performance Assessment
- Answer Keys for Student Pages
- Google Slides and Google Forms Versions



UNIT AT A GLANCE



- Students write binary messages, invent codes, and build models.
- Teacher background, lesson plans, and student pages in every phase.
- Aligned to NGSS 4-PS4-3.

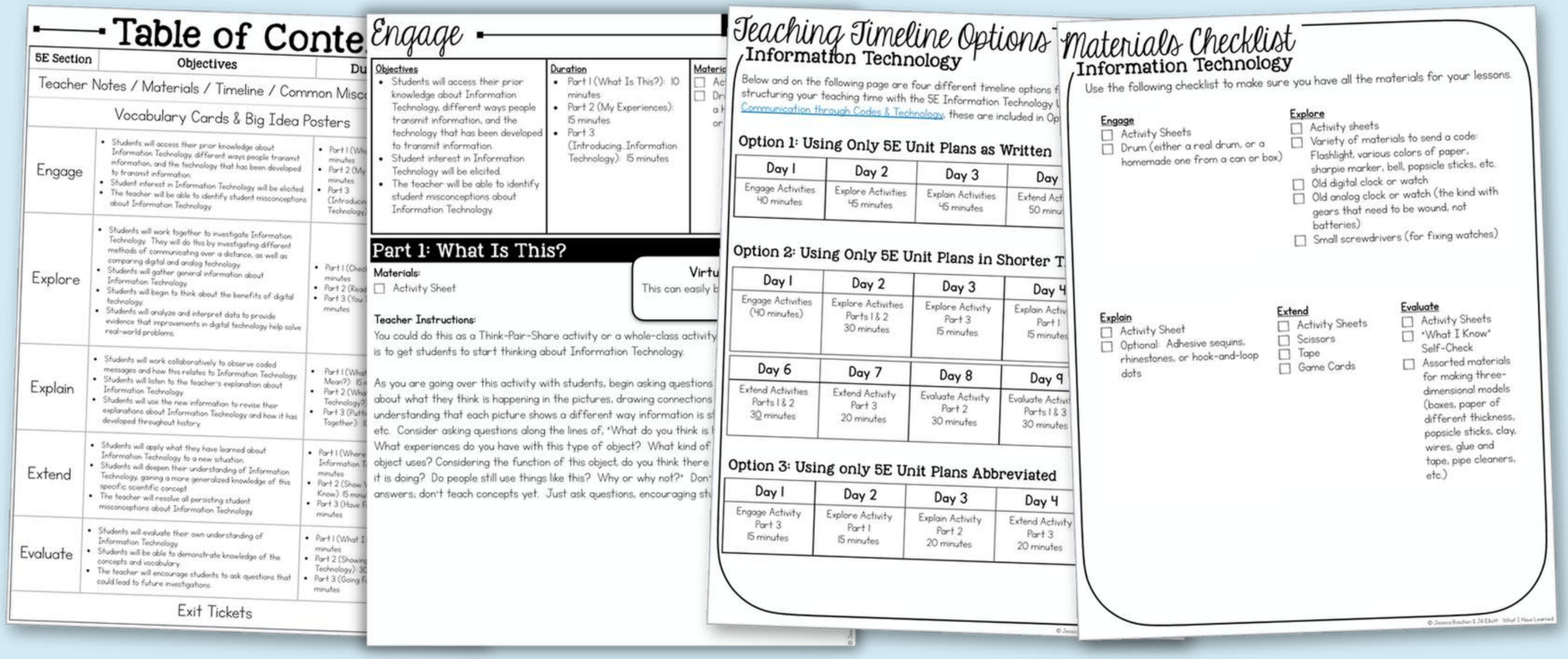
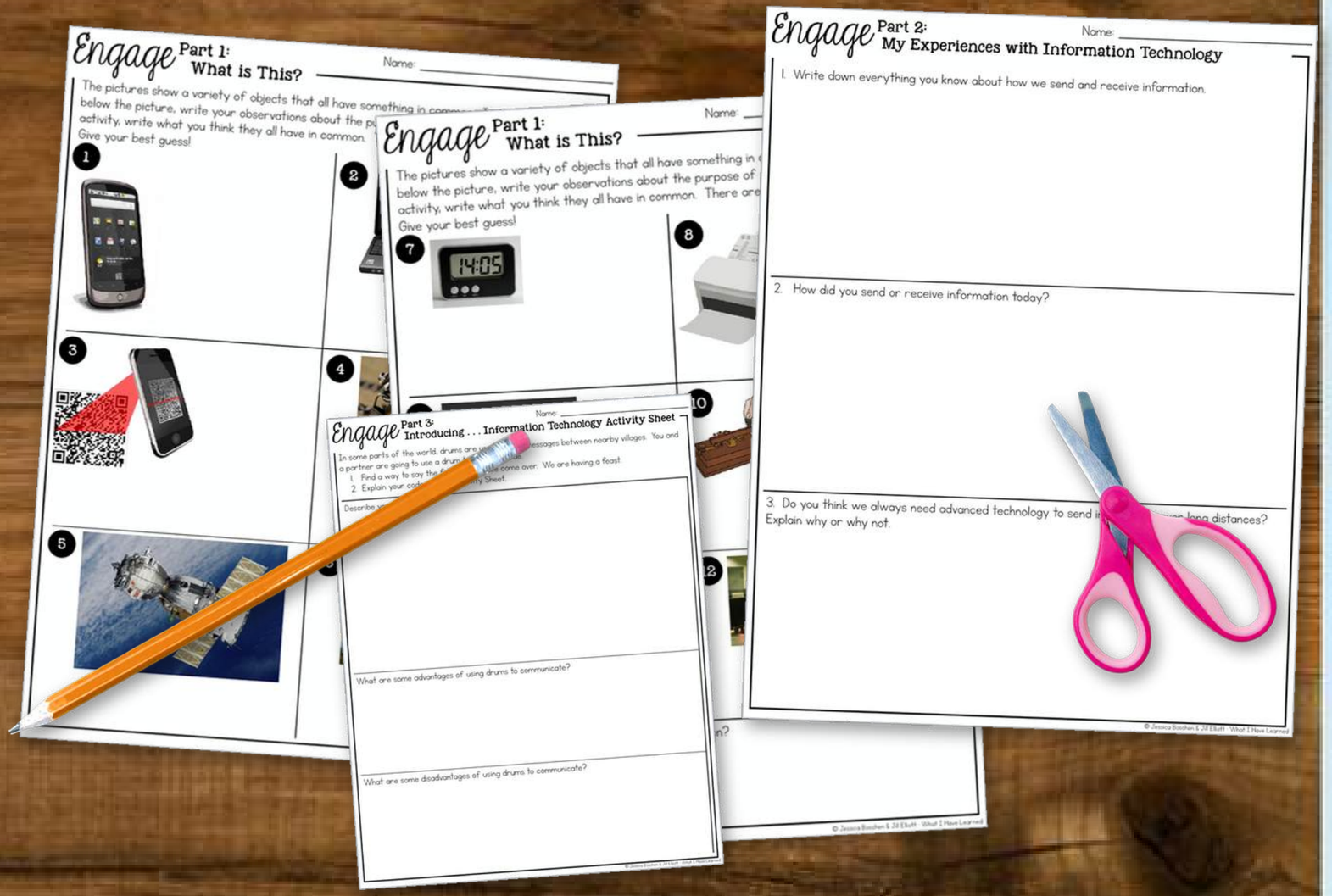


Table of Contents | **Teacher Notes** | **Timeline Options** | **Materials Checklist**

ENGAGE



Teacher background, lesson plans, student pages, and answer key

E E E E E

Spark curiosity with everyday technology

1 What Is This?

Students look at six objects, from phones to satellites, and tell what they have in common.

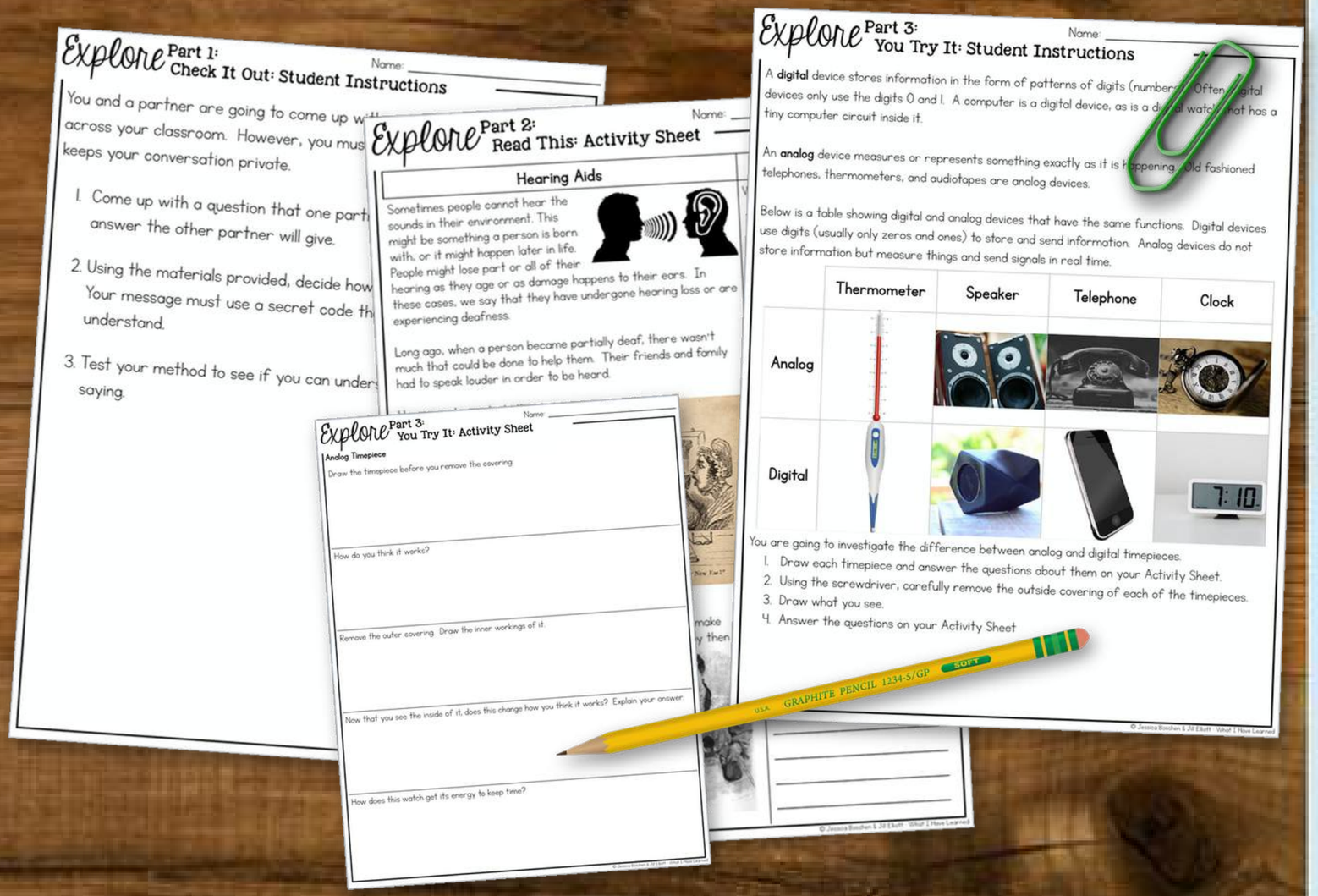
2 My Experiences

Students describe how they send and receive information every day.

3 Introducing Information Technology

Students invent a drum code to send a message to a partner.

EXPLORE



Teacher background, lesson plans, student pages, and answer key

E E E E E

Investigate ways to send information

1 Check It Out

Partners invent a private way to talk across the classroom.

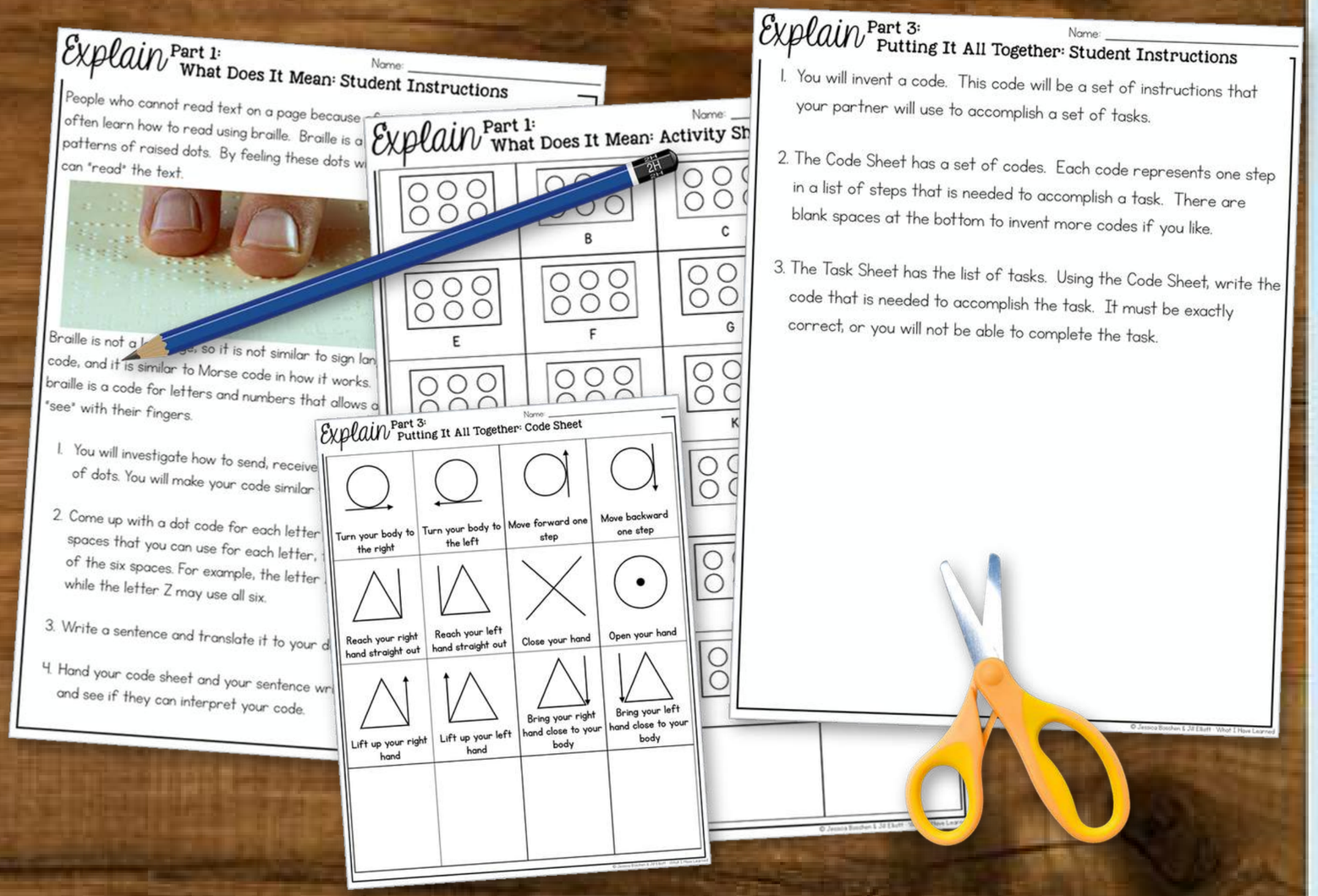
2 Read This

Students read how hearing aids work and answer guiding questions.

3 You Try It

Students compare analog and digital timepieces and look inside to see how they work.

EXPLAIN



Teacher background, lesson plans, student pages, and answer key

E E E E E

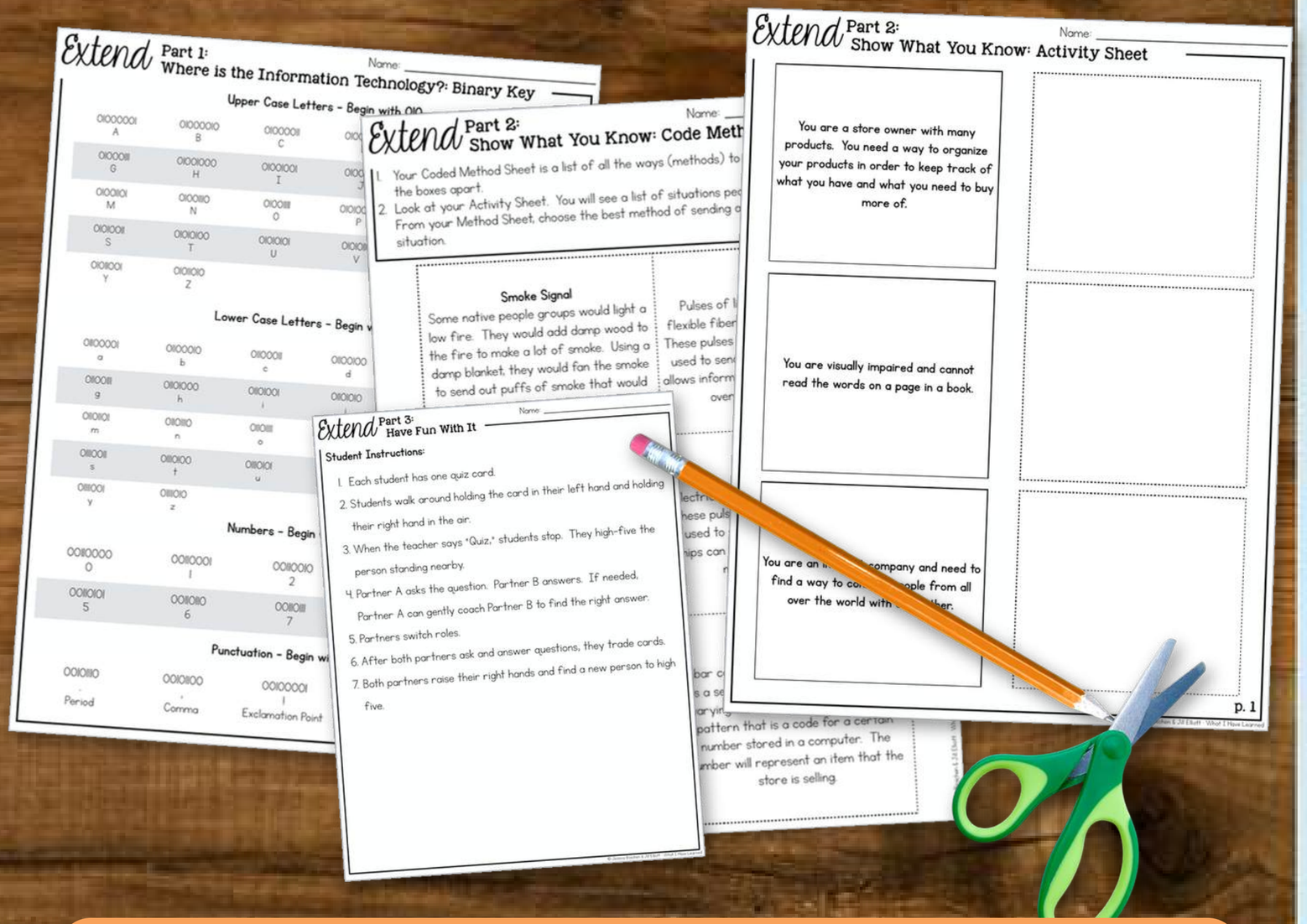
Build explanations from evidence

1 What Does It Mean?
Students learn braille and write a message in dot code.

2 What Is Information Technology?
Students read about technology and sum up what they learned.

3 Putting It All Together
Students invent a code to guide a partner through a set of tasks.

EXTEND



Teacher background, lesson plans, student pages, and answer key

E E E E E

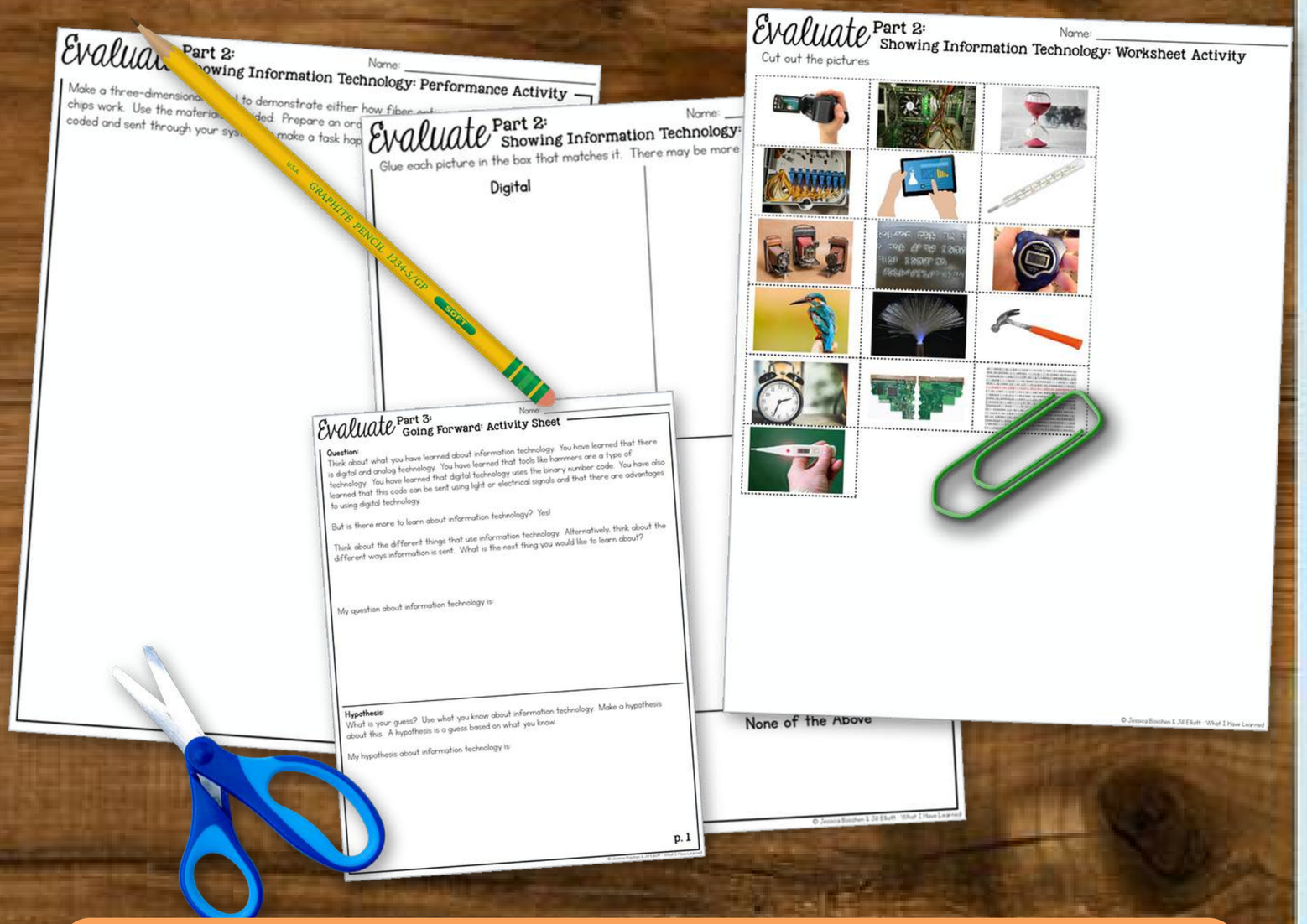
Apply codes to new situations

1. **Where Is Information Technology?**
   Students use a binary key to write messages in zeros and ones.

2. **Show What You Know**
   Students match coded message methods to real-life situations.

3. **Have Fun With It**
   Students trade quiz cards with partners and high-five between rounds.

EVALUATE



Teacher background, lesson plans, student pages, and answer key

E E E E E

Check understanding with evidence

1 What I Know

Students describe digital and analog technology and score themselves with a rubric.

2 Showing Information Technology

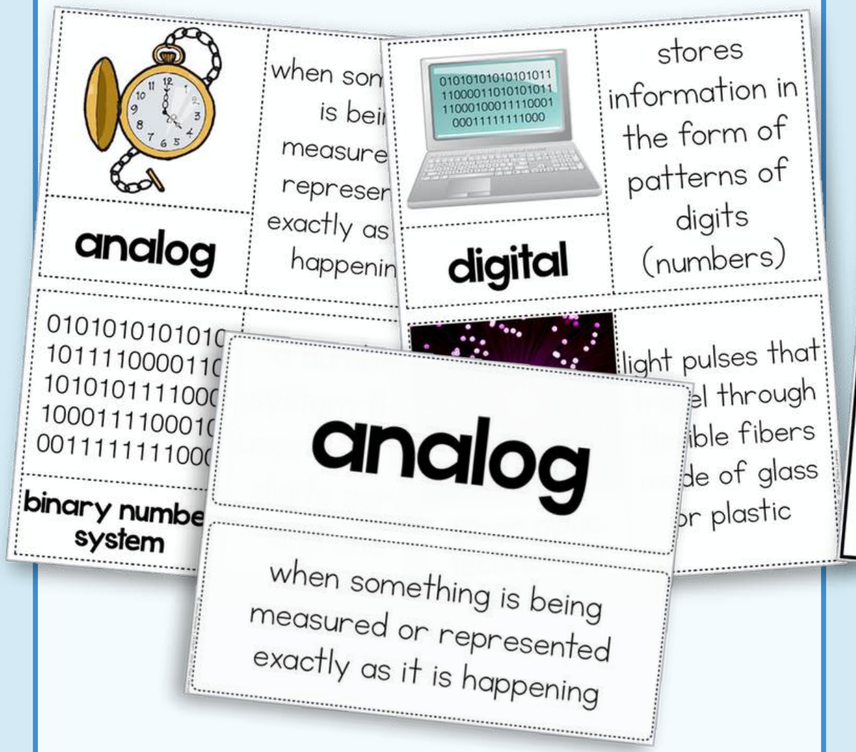
Students build a 3D model of fiber optics or a computer chip and explain it.

3 Going Forward

Students write a new question and hypothesis about information technology.

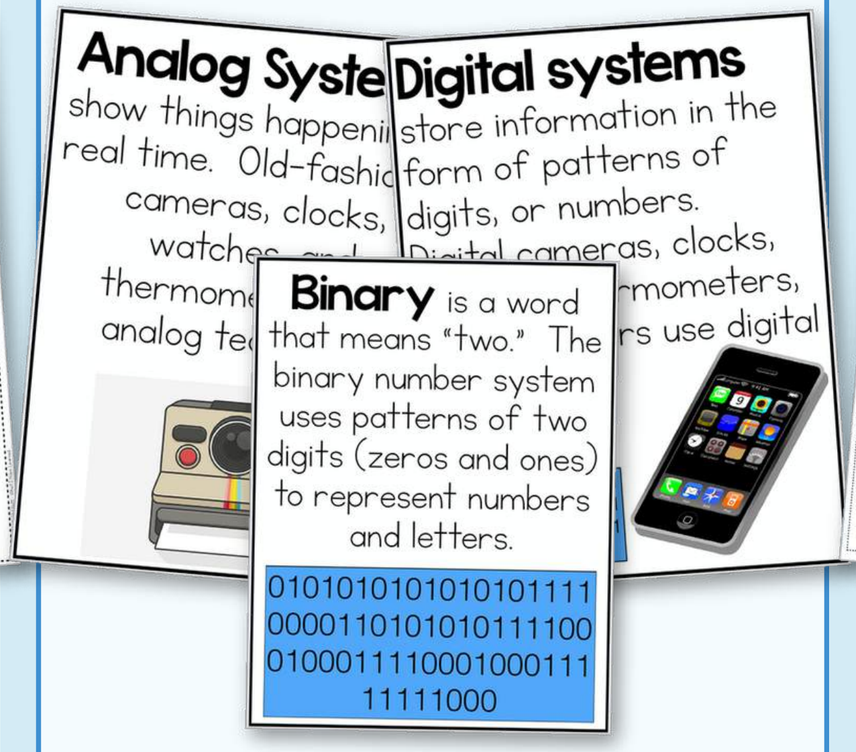
VOCABULARY, POSTERS & EXIT TICKETS

VOCABULARY CARDS



Picture cards and word cards for analog, binary number system, code, digital, fiber optic technology, and more.

BIG IDEA POSTERS



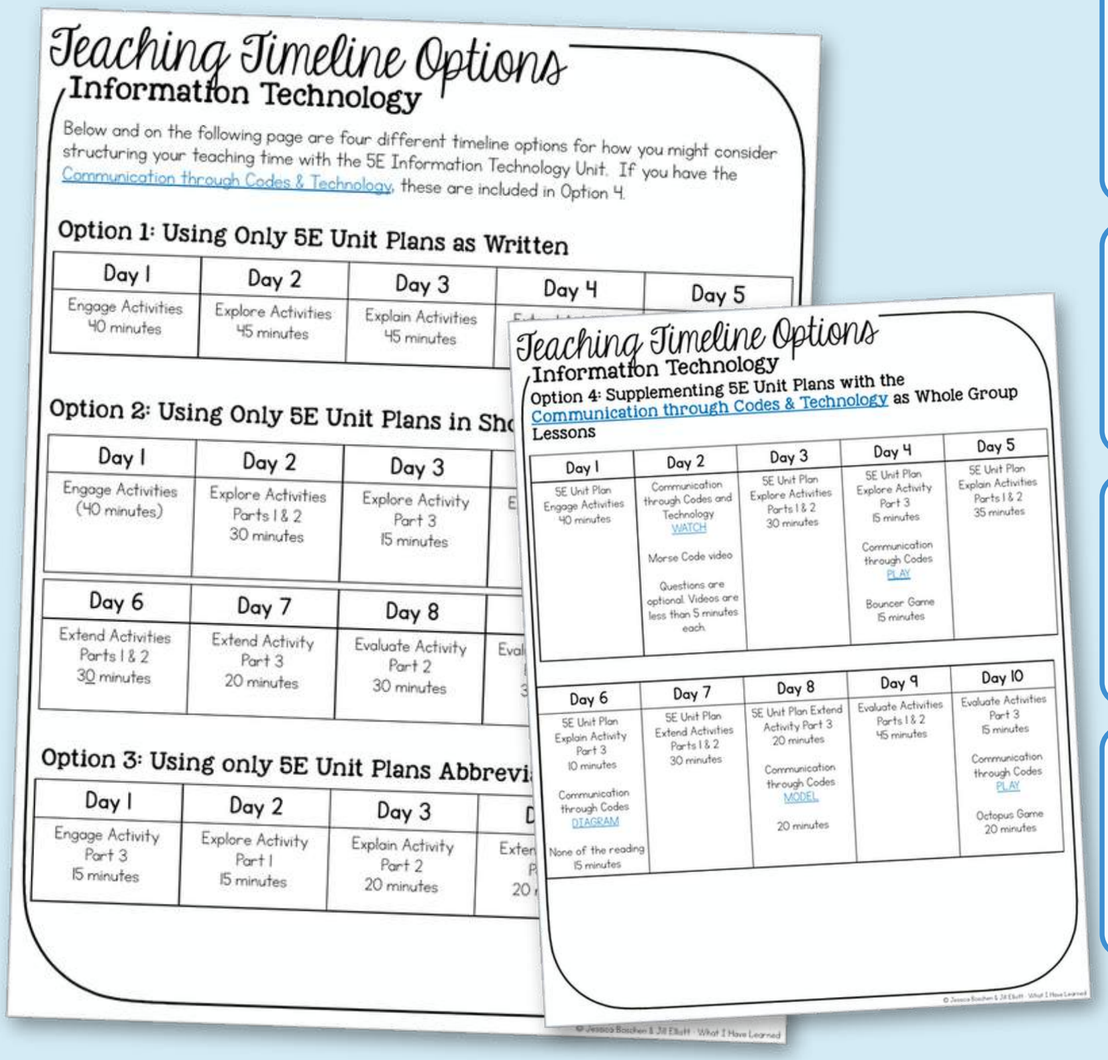
Six posters on analog systems, digital systems, binary, simple technology, fiber optics, and computer chips.

EXIT TICKETS



10 exit tickets, each in short answer, fill-in-the-blank, and multiple choice formats.

WAYS TO USE IN YOUR CLASSROOM



Teaching Timeline Options
Information Technology

Below and on the following page are four different timeline options for how you might consider structuring your teaching time with the 5E Information Technology Unit. If you have the Communication through Codes & Technology, these are included in Option 4.

Option 1: Using Only 5E Unit Plans as Written

Day 1	Day 2	Day 3	Day 4	Day 5
Engage Activities 40 minutes	Explore Activities 45 minutes	Explain Activities 45 minutes		

Option 2: Using Only 5E Unit Plans in Sh

Day 1	Day 2	Day 3	
Engage Activities (40 minutes)	Explore Activities Parts 1 & 2 30 minutes	Explore Activity Part 3 15 minutes	E

Day 6	Day 7	Day 8	
Extend Activities Parts 1 & 2 30 minutes	Extend Activity Part 3 20 minutes	Evaluate Activity Part 2 30 minutes	Eval

Option 3: Using only 5E Unit Plans Abbrevi

Day 1	Day 2	Day 3	
Engage Activity Part 3 15 minutes	Explore Activity Part 1 15 minutes	Explain Activity Part 2 20 minutes	Exte P 20

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Teaching Timeline Options
Information Technology

Option 4: Supplementing 5E Unit Plans with the Communication through Codes & Technology as Whole Group Lessons

Day 1	Day 2	Day 3	Day 4	Day 5
5E Unit Plan Engage Activities 40 minutes	Communication through Codes and Technology WATCH Morse Code video Questions are optional. Videos are less than 5 minutes each.	5E Unit Plan Explore Activities Parts 1 & 2 30 minutes	5E Unit Plan Explore Activity Part 3 15 minutes Communication through Codes PLAY Bouncer Game 15 minutes	5E Unit Plan Explain Activities Parts 1 & 2 35 minutes

Day 6	Day 7	Day 8	Day 9	Day 10
5E Unit Plan Explain Activity Part 3 10 minutes Communication through Codes DIAGRAM None of the reading 15 minutes	5E Unit Plan Extend Activities Parts 1 & 2 30 minutes	5E Unit Plan Extend Activity Part 3 20 minutes Communication through Codes MODEL 20 minutes	Evaluate Activities Parts 1 & 2 45 minutes	Evaluate Activities Part 3 15 minutes Communication through Codes PLAY Octopus Game 20 minutes

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1

Whole-Class 5E Unit

Teach one phase a day over 5 days as written, with 40 to 60 minutes per phase.

2

Shorter Science Blocks

Spread the unit across 9 days in shorter time blocks when science minutes are limited.

3

Alongside Science Stations

Add the Communication through Codes Science Stations for a 10-day plan.

4

Formative Checks

Use the exit tickets throughout the unit to see who needs reteaching before the performance activity.

TEACHING TIMELINE OPTIONS

Option 1 — 5 days
As Written

Day 1	Day 2	Day 3	Day 4	Day 5
Engage	**Explore**	**Explain**	**Extend**	**Evaluate**
40 min	45 min	45 min	50 min	60 min

Option 2 — 9 days
Shorter Time Blocks

Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9
Engage	**Explore 1–2**	**Explore 3**	**Explain 1**	**Explain 2–3**	**Extend 1–2**	**Extend 3**	**Evaluate 2**	**Evaluate 1 & 3**
40 min	30 min	15 min	15 min	30 min	30 min	20 min	30 min	30 min

Option 3 — 5 days
Abbreviated

Day 1	Day 2	Day 3	Day 4	Day 5
Engage 3	**Explore 1**	**Explain 2**	**Extend 3**	**Evaluate 1**
15 min	15 min	20 min	20 min	15 min

Option 4 — 10 days
With Science Stations

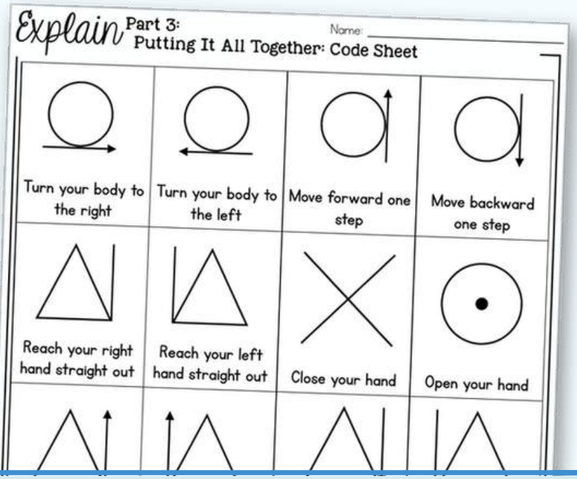
Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10
Engage	**Explore 1–2**	**Explore 3**	**Explain 1–2**	**Station**	**Explain 3**	**Extend 1–2**	**Extend 3**	**Evaluate 1–2**	**Evaluate 3**
40 min	30 min +5 watch	15 min +15 station	35 min	15 min	10 min +20 station	30 min	20 min +20 station	45 min	15 min

Orange days are Science Station lessons. Magenta notes are extra station activities you can add that day.

YOU WILL LOVE THIS BECAUSE

Hands-On From Day One

Students write binary messages, invent codes, and build models, so information technology makes sense.

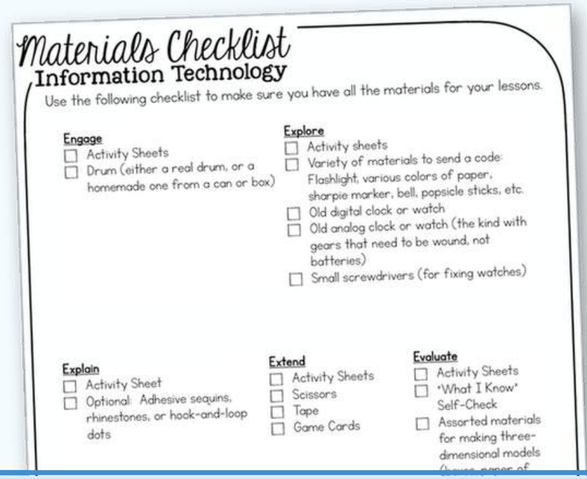

Explain Part 3: Putting It All Together: Code Sheet

Name: _____

Turn your body to the right	Turn your body to the left	Move forward one step	Move backward one step
Reach your right hand straight out	Reach your left hand straight out	Close your hand	Open your hand

Planned and Ready to Teach

Teacher notes, a misconceptions guide, a materials checklist, and answer keys are done for you.


Materials Checklist

Information Technology

Use the following checklist to make sure you have all the materials for your lessons.

Engage
- ☐ Activity Sheets
- ☐ Drum (either a real drum, or a homemade one from a can or box)

Explore
- ☐ Activity sheets
- ☐ Variety of materials to send a code: Flashlight, various colors of paper, sharpie marker, bell, popsicle sticks, etc.
- ☐ Old digital clock or watch
- ☐ Old analog clock or watch (the kind with gears that need to be wound, not batteries)
- ☐ Small screwdrivers (for fixing watches)

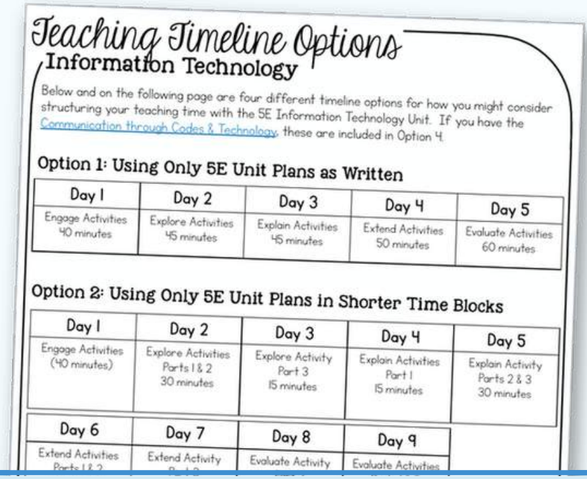
Explain
- ☐ Activity Sheet
- ☐ Optional: Adhesive sequins, rhinestones, or hook-and-loop dots

Extend
- ☐ Activity Sheets
- ☐ Scissors
- ☐ Tape
- ☐ Game Cards

Evaluate
- ☐ Activity Sheets
- ☐ "What I Know" Self-Check
- ☐ Assorted materials for making three-dimensional models

Fits Your Schedule

Choose from 4 timeline options, and use the Google Slides and Google Forms versions for a print or digital classroom.


Teaching Timeline Options

Information Technology

Below and on the following page are four different timeline options for how you might consider structuring your teaching time with the 5E Information Technology Unit. If you have the Communication through Codes & Technology, these are included in Option 4.

Option 1: Using Only 5E Unit Plans as Written

Day 1	Day 2	Day 3	Day 4	Day 5
Engage Activities 40 minutes	Explore Activities 45 minutes	Explain Activities 45 minutes	Extend Activities 50 minutes	Evaluate Activities 60 minutes

Option 2: Using Only 5E Unit Plans in Shorter Time Blocks

Day 1	Day 2	Day 3	Day 4	Day 5
Engage Activities (40 minutes)	Explore Activities Parts 1 & 2 30 minutes	Explore Activity Part 3 15 minutes	Explain Activities Part 1 15 minutes	Explain Activity Parts 2 & 3 30 minutes
Day 6	Day 7	Day 8	Day 9	
Extend Activities	Extend Activity	Evaluate Activity	Evaluate Activities	

TEACHERS LOVE IT!

★★★★★

Was great for helping hit a standard students struggle to understand. Students enjoyed this unit!

Kimberly R.

★★★★★

So much information packed into this resource. My students got a lot of use of it.

Vanessa Galvan

★★★★★

This resource was perfect for what I intended for my students to learn.

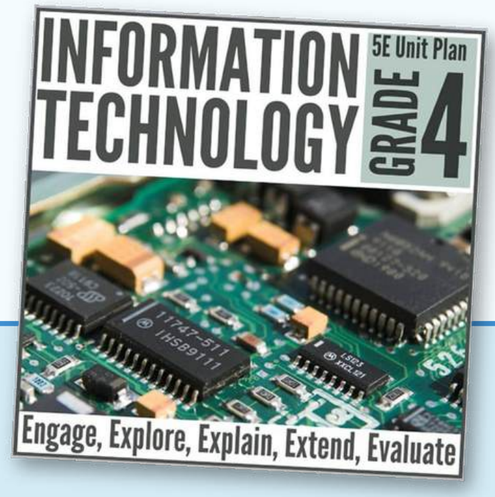
Third Inning





READY FOR YOUR CLASSROOM

- **Instant digital download**
- **Print and use the activities**
- **Google Slides and Forms versions**

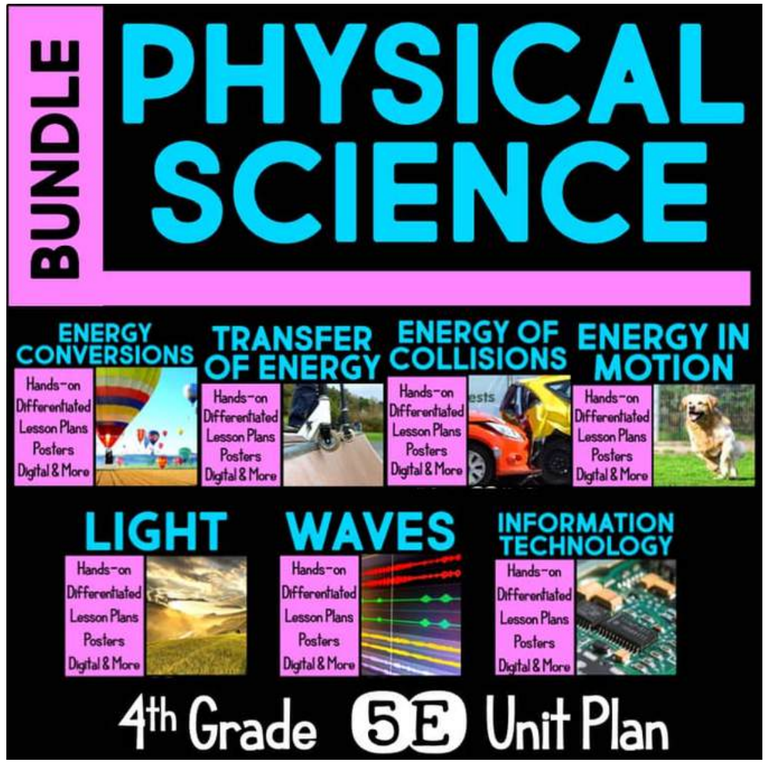


WANT MORE 4TH GRADE 5E UNITS?

Save with a topic bundle or the full-year bundle.

TOPIC BUNDLE

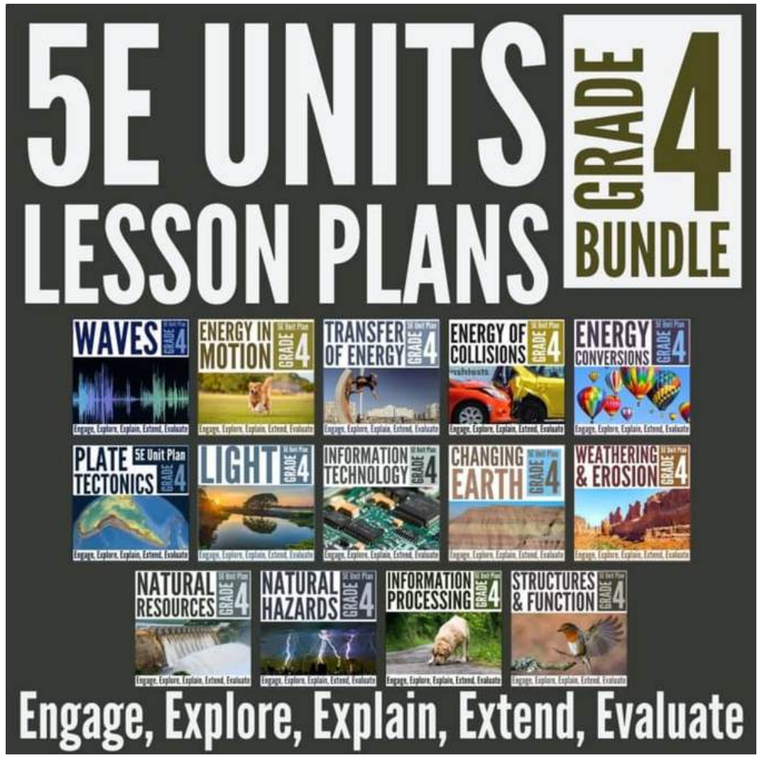
GOOD VALUE



SEE THE BUNDLE

FULL-YEAR BUNDLE

BEST VALUE



SEE THE BUNDLE

My passion is making learning accessible to all students.
I love scaffolding learning, breaking down the concepts and building them up so that students can see the connections.
I love figuring out the small components that build up to the big ideas and helping students see it all.



teach MATH | teach SCIENCE | teach READING | teach WRITING

What I have LEARNED