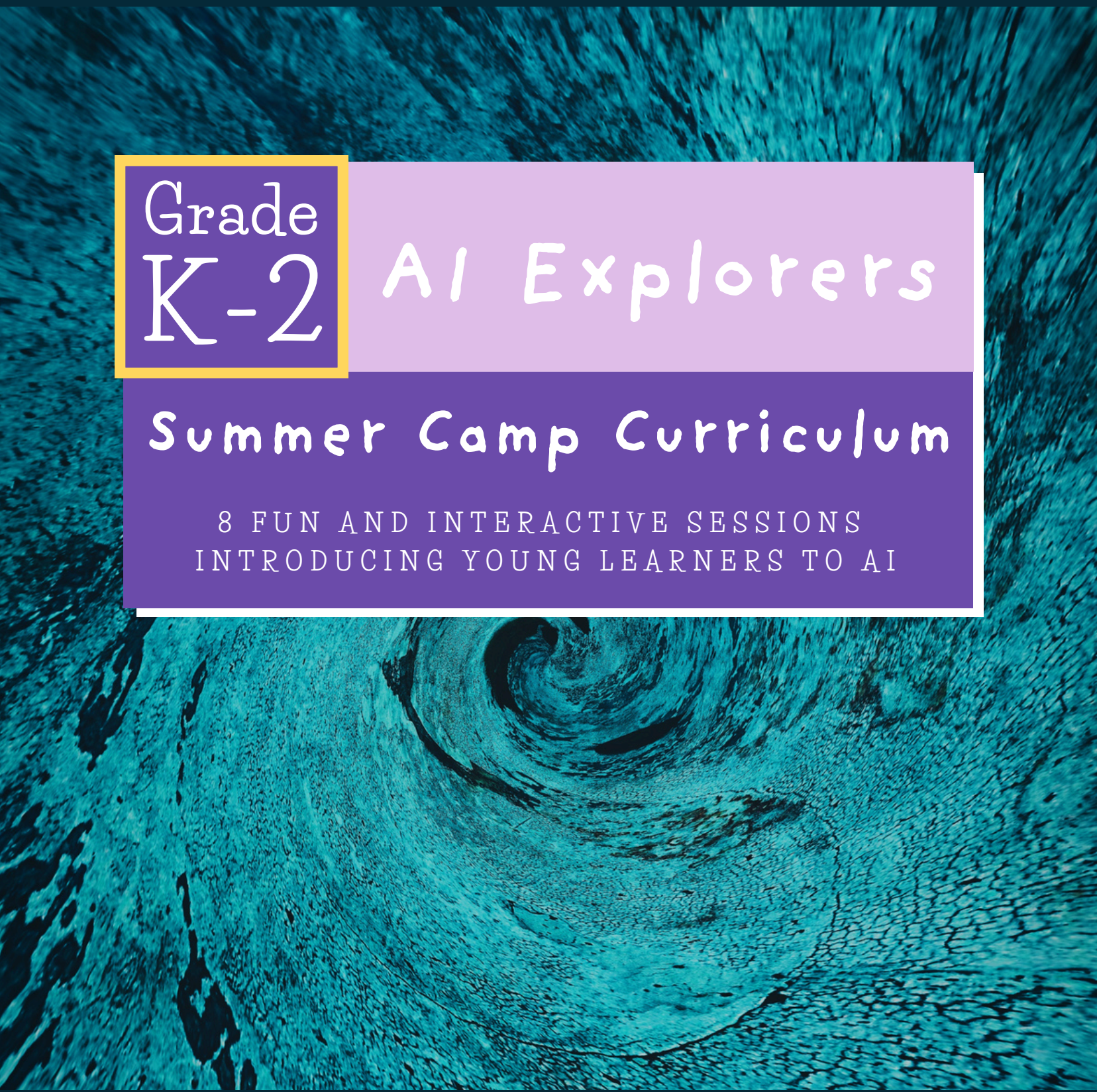
FIVE BIG IDEAS IN AI



Grade K-2 AI Explorers

Summer Camp Curriculum

8 FUN AND INTERACTIVE SESSIONS
INTRODUCING YOUNG LEARNERS TO AI

32 Hours of Educational Content
8 Sessions · 4 Hours per Session
Grades K–2 | 2026 Edition

ReadyAi

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Session 1: What Are Smart Helpers and What Do They Do?

AI4K12 Big Idea: Perception
Focus: Smart systems use sensors or inputs to notice things in the world around them.
Mini-output: A “What My Smart Helper Does” idea card.

04

2

Session 2: How Do Smart Things Learn?

AI4K12 Big Idea: Learning
Focus: Smart systems learn from examples and data provided by people.
Mini-output: A “Training My Smart Helper” example set.

28

3

Session 3: How Do Smart Things Make Choices?

AI4K12 Big Idea: Representation & Reasoning
Focus: Smart systems use clues, rules, or questions to help make decisions.
Mini-output: A simple “If this, then that” rule or decision path.

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Session 4: How Do Smart Things Understand People?

AI4K12 Big Idea: Natural Interaction
Focus: Smart systems can respond to people through words, pictures, sounds, gestures, or choices, but they may misunderstand.
Mini-output: A “How People Talk to My Smart Thing” interaction card.

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Session 5: How Can Smart Things Help People Fairly and Safely?

AI4K12 Big Idea: Societal Impact
Focus: Smart systems are made by people and can help, confuse, leave people out, or need improvement.
Mini-output: A “Helpful, Fair, and Safe” improvement card. **97**

6

Session 6: Project Design and Plan Formation

Students choose or refine their Smart Helper idea, define what it does, what it notices, what it learns from, how it makes choices, and who it helps. This session should produce a clear project plan, not just brainstorming. **119**

7

Session 7: Project Production and Personalized Optimization

Students create the main body of their project through drawing, building, storyboarding, role-play, poster-making, or another age-appropriate format. Teachers circulate and guide students back to the Five Big Ideas as they work. **142**

8

Session 8: Continued Project Refinement and Final Product Organization

Students finish, revise, organize, and prepare to share. The showcase is part of this session, but the session should not become only a presentation day. It should still include meaningful creation and refinement time. **166**

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SUMMARY

For the project progression itself, each session should answer one guiding question tied directly to the build (and these are mostly just subtle shifts from our earlier outline):

- Session 1: What does our Smart Helper do?
- Session 2: What does it need to learn?
- Session 3: What else should it learn from?
- Session 4: What does it need to notice?
- Session 5: How does it decide what to do?
- Session 6: How do people help it?
- Session 7: How do we make it better for everyone?
- Session 8: How do we share it?

This gives us a clear developmental arc that is visible to both students and facilitators.

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Sesson 1

What Can a Smart Thing Notice?

Alignment with Big Ideas

Big Idea 1: Perception
Computers perceive the world using sensors.

Lesson Objectives

- By the end of this session, students will understand that smart systems use clues from the world to notice things and make guesses.
- By the end of this session, students will be able to identify simple clues such as color, shape, size, sound, movement, number, location, and object features.
- By the end of this session, students will be able to explain that some clues are easier for a smart system to use than others.
- By the end of this session, students will be able to observe how clearer input can help an AI or AI-like system make a better judgment.
- By the end of this session, students will complete the first page of their AI Lab Journal, showing what a smart thing can notice.

Key Concept

AI systems use input from the world to make judgments. They do not understand the world like people do. They use clues, such as color, shape, movement, sound, or patterns, to recognize things and make guesses. If the input is unclear, missing, or too vague, the system may make a wrong guess. If the input is clearer and richer, the system may make a better guess.

Child-Friendly Big Question

What can a smart thing notice?

Child-Friendly Takeaway

Smart things need clear clues to make better guesses.

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Success Criteria

- Students show understanding when they can:
- Name at least one clue a smart thing might notice.
- Sort objects or cards using a visible feature.
- Explain why they grouped objects together.
- Tell the difference between a clear clue and a vague clue.
- Observe that a smart system may make a mistake when clues are unclear.
- Explain that adding clearer or additional clues can help a smart system make a better guess.
- Complete AI Lab Journal Page 1: What My Smart Thing Notices.

Materials and Prepared Resources

Classroom PPT

The PPT should include:

- Lesson title: What Can a Smart Thing Notice?
- Big question slide: What can a smart thing notice?
- Visual concept slide: Smart things use clues to make guesses.
- Picture examples of clues: color, shape, size, number, sound, movement, location, parts, and use.
- Activity instructions for each round.
- Clear clue vs. tricky clue slide.
- Predict → Test → Observe → Summarize slide.
- AI verification demo slides.
- Localized real-life AI examples: smart door access, face recognition gate, robot vacuum, smart traffic light, phone object recognition, and map navigation.
- AI Lab Journal instruction slide.
- Lesson summary slide.

Student Materials

- AI Lab Journal booklet.
- Session 1 journal page: What My Smart Thing Notices
- Sorting card sets with familiar examples for Chinese children:
- School items: pencil, eraser, ruler, schoolbag, exercise book, red scarf, water bottle, lunch box.
- Home items: slippers, bowl, chopsticks, rice cooker, toy, toothbrush, umbrella.
- Food items: baozi, noodles, rice, apple, banana, dumpling, mooncake, tangyuan.
- Transportation items: bicycle, e-bike, bus, subway, car, high-speed train, airplane.
- Daily-life AI examples: face gate, robot vacuum, smart speaker, traffic light, phone camera, delivery robot.
- Clue cards with icons:
  Color. Shape. Size. Sound. Movement. Number. Location. Parts.Use.

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Demo Materials

- AI mini robot as classroom character and recurring teaching tool.
- Teacher device for AI verification.
- Recommended verification options, depending on local availability:
- Option A: A simple image recognition demo using phone object recognition or image search.
- Option B: A teacher-prepared video showing AI recognition success and error.
- Option C: A simple slide-based “AI simulator” where the teacher reveals how a system guesses based on limited clues.
- Option D: AI mini robot or robot vacuum demonstration, if available, showing how a system responds to obstacles or input.
- For this lesson, the robot/tool is used as a **demonstration and verification aid**, not as a programming device.

Teacher Preparation

- Prepare object and picture card sets.
- Prepare clear clue and vague clue examples.
- Prepare the AI verification demo in advance and test it before class.
- Prepare one example where the AI or AI-like system makes a reasonable guess with clear input.
- Prepare one example where the AI or AI-like system struggles because the input is unclear, partial, or too vague.
- Prepare AI Lab Journals.
- Prepare sticker/icons if students will use visual supports instead of writing.

Time Allocation and Procedure

Total session time: **4 hours**
Structured learning time: approximately **200 minutes**
Break/reset time: approximately **40 minutes**

Progression Logic

Round 1: Students discover what a clue is (for AI).
Round 2: Students discover that different clues can create different categories.
Round 3: Students discover that vague clues are not suitable for a smart system.
Round 4: Students verify how input affects AI judgment through Predict → Test → Observe → Summarize.
Final Output: Students express what a smart thing can notice in their AI Lab Journal.

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Part 1: Concept Introduction and Context Building

45 minutes

Cognitive Purpose:
Students discover what a clue is and begin to connect noticing to AI perception.

0:00–0:07 Arrival Prompt: Find Something Smart

Teacher Instructions

As students enter, invite them to look around the classroom.

Say:
"Today we are going to think about smart things. Can you find something in the room that you think is smart?"
Invite a few students to point, move, or share.

Ask:
"What did you choose?"

Teacher Reference Answer

Child-friendly answer: "A smart thing can do something helpful or respond to something."

Teacher concept note: At this stage, students are surfacing prior ideas. Do not define AI too narrowly yet.

Possible student responses: "Computer," "phone," "teacher," "robot," "light," "book," "my brain."

Common misconception: Students may think "smart" means "knows everything."

Teacher closing language: "Today we will learn that smart things do not know everything. They need clues."

Optional follow-up: "What does your smart thing notice or respond to?"

Student Activities

Students identify objects they think are smart and share simple reasons.

Interaction Pattern

Individual noticing followed by whole-class sharing.

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0:07–0:15 Introduce the Big Question and AI Mini Robot

Teacher Instructions

Introduce the AI mini robot.

Say:
"This is our AI mini robot friend. We will use it to help us learn about AI. Today, we are not asking it to do a big job yet. Today, we are thinking about what smart things can notice."

Display the big question:
What can a smart thing notice?

Ask:
"What can a smart thing notice?"

Teacher Reference Answer

Child-friendly answer: "It can notice clues like color, shape, sound, movement, or where something is."

Teacher concept note: This introduces perception as input. AI systems use data from the world.

Possible student responses: "People," "colors," "cars," "sounds," "faces," "food," "toys."
Common misconception: Students may say "everything."

Teacher closing language: "Smart things can notice some clues, but not everything. They need the right clues to make a good guess."

Optional follow-up: "Can it notice color? Can it notice sound? Can it notice your favorite food just by looking?"

Student Activities

Students observe the AI mini robot and respond to the big question.

Interaction Pattern

Whole class.

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0:15–0:28 Story: The Robot That Needs Clues

Teacher Instructions	Place several objects in front of students, such as a red ball, blue block, pencil, and cup. Say: "Our robot wants to help clean the classroom. But if I say, 'Pick up the thing,' the robot gets confused. It needs clues." Ask: "What is a clue?"
Teacher Reference Answer	Child-friendly answer: "A clue is something that helps us figure something out." Teacher concept note: A clue is a child-friendly way to describe input or features. Possible student responses: "A hint," "something that helps," "color," "shape." Common misconception: Students may think a clue is always a secret or mystery-game clue. Teacher closing language: "A clue is information that helps a smart thing make a guess." Optional follow-up: "What clue could help the robot choose the ball?" Ask: "What clue could help the robot?"
Teacher Reference Answer	Child-friendly answer: "We can tell it the color, shape, size, or what the object is used for." Teacher concept note: Students are identifying features that an AI-like system could process. Possible student responses: "Red," "round," "small," "it bounces," "it is a ball." Common misconception: Students may give the object name instead of a clue.

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	Teacher closing language: "The name can help people, but smart systems often need clues they can notice, like color or shape." Optional follow-up: "What could the robot see?" Ask: "If I say 'the red thing,' what might the robot pick?"
Teacher Reference Answer	Child-friendly answer: "It might pick anything red." Teacher concept note: One clue may narrow choices, but may not uniquely identify the target. Possible student responses: "The ball," "the red car," "anything red." Common misconception: Students may assume the robot knows which red object the teacher means. Teacher closing language: "One clue can help, but sometimes it is not enough." Optional follow-up: "What if there are two red things?" Ask: "If there are two red things, what else would help?"
Teacher Reference Answer	Child-friendly answer: "Another clue would help, like shape, size, or what it does." Teacher concept note: Students are beginning to understand that multiple features improve judgment. Possible student responses: "Round," "with wheels," "small," "you can eat it." Common misconception: Students may repeat the same clue. Teacher closing language: "More clear clues can help a smart thing make a better guess." Optional follow-up: "Can we use two clues together?"

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Student Activities

Students name clues and test how clues help the robot identify objects.

Interaction Pattern

Whole-class guided demonstration.

0:28–0:38 Build the Class Clue Chart

Teacher Instructions

Create a class chart titled:
Clues Smart Things Can Notice

Add categories:
Color.
Shape.
Size.
Number.
Sound.
Movement.
Location.
Parts.
Use.

Ask:
"Can the robot see it?"

Teacher Reference Answer

Child-friendly answer: "The robot can use clues it can see, like color or shape."

Teacher concept note: This helps distinguish observable inputs from internal or subjective judgments.

Possible student responses: "Yes," "No," "It can see red," "It can see wheels."

Common misconception: Students may think the robot can see thoughts, feelings, or preferences.

Teacher closing language: "Smart things need clues they can receive. Some clues are easy to see, hear, or count."

Optional follow-up: "Can the robot see 'favorite'?"

Ask:
"Can the robot count it?"

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Teacher Reference Answer

Child-friendly answer: "It can count things like wheels, legs, blocks, or people if it has the right input."

Teacher concept note: Counting is a concrete form of machine-readable information.

Possible student responses: "Wheels," "legs," "people," "two eyes."

Common misconception: Students may think counting means understanding.

Teacher closing language: "Counting can give a smart thing useful information, but it still needs people to design what to count."

Optional follow-up: "What could our robot count in the classroom?"

Student Activities

Students contribute clues to the shared chart.

Interaction Pattern

Whole class.

0:38–0:45 Micro-Reflection

Teacher Instructions

Ask:
"What is one clue that helped the robot?"

Teacher Reference Answer

Child-friendly answer: "A helpful clue could be color, shape, size, sound, number, or where something is."

Teacher concept note: Students should connect clues to the system's ability to make a judgment.

Possible student responses: "Red," "round," "big," "it has wheels," "it is on the table."

Common misconception: Students may say "because it is smart."

Teacher closing language: "The robot did not just know. The clue helped it guess."

Optional follow-up: "What would happen if we gave no clue?"

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Assessment	Teacher checks whether students can name at least one usable clue.

Break

10
minutes

Part 2: Sorting Game, Round 1

45
minutes

Cognitive Purpose:
Students discover that different clues can create different categories.

0:55–1:05 Reconnect and Explain the Task

Teacher Instructions

Say:
"Before break, we learned that smart things use clues. Now we will use clues to sort cards."

Give each group a set of familiar picture cards.

Ask:
"What clue could you use to sort these?"

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