**Pattern Power: Exploring Artificial Intelligence with Google Lens**

* Create slides for this.
* Find photos to use for the pattern recognition in Activity #1
* Create the worksheet

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Grades: 7-12

Time: 60–75 minutes

**Lesson Overview**

In this lesson, students will delve into the world of Artificial Intelligence (AI) by exploring pattern recognition using Google Lens. They will identify objects, utilize Google Lens to gather information, and participate in a pattern treasure hunt. These activities aim to enhance their understanding of how AI systems, like Google Lens, use pattern recognition to interpret and learn about the world. Group discussions and brainstorming sessions will further enrich their learning experience, making technology both fun and educational.

**Supplies Needed:**

Technology & Tools:

* Computer and projector
* Smart board or whiteboard with markers
* Devices with Google Lens installed (smartphones or tablets)
* (Optional) Computers with internet access
* (Optional) Connection cable or wireless setup to project a smartphone screen

Materials for Activities:

* A variety of objects or printed photos for identification (plants, animals, landmarks, products, etc.) for Activity #1
	+ Quick Tip: To adjust the difficulty level, use full images of animals, plants, and objects for easier identification. For a greater challenge, use close-up shots—such as fur textures, a single leaf, or a small section of an object—to make students rely more on pattern recognition.
* Worksheets
* Paper and writing utensils
* Clipboards

Internet & Software:

* Reliable internet access for using Google Lens

### **Teacher Preparation:**

1. Review the entire lesson plan.
2. Gather all the necessary supplies.
3. Print worksheets for each student.
4. Ensure your computer and projector are functioning properly, and have the slides ready to display.
5. Familiarize yourself with Google Lens and its features.
6. Collect a variety of photos or objects for students to identify. (See slides for options.)
7. Ensure all devices have Google Lens installed.
8. Practice using Google Lens with the specific images you've chosen. This will help you anticipate any potential issues and ensure a smooth demonstration.
9. If projecting from your phone, test the connection beforehand.

**Icebreaker: How Smart is Your World?**

1. Display Slide 1: Title Slide.
2. Turn to Slide 2.
3. Pass out a piece of paper and writing utensils.
4. Say: "Let's do a 60-second challenge! Where do you see Artificial Intelligence (AI) in your daily life? Think fast and write down as many examples as you can. Ready? Go!"
5. Set a timer for one minute.
6. When time is up, say: "Let’s see who came up with the most AI examples! Raise your hand if you wrote at least five… seven… ten?" (Pause after each number to see responses.)
7. Have students turn to a partner and share their most interesting AI example.
8. Then, bring the class back together and lead a group discussion about the different ways AI is used in everyday life.
9. After students have shared their ideas, introduce one surprising way AI is used—for example, AI in smart traffic lights, AI-generated music, or AI in weather prediction.

**Learn: Exploring AI and Pattern Recognition**

**Part 1: Exploring AI and Pattern Recognition**

1. Say: "Have you ever played the game 'I Spy'? In this game, you find an object based on clues about its color, shape, or size. When you play this, you're using pattern recognition. Your brain is excellent at finding patterns."
2. Say: "Similarly, computers can learn to recognize patterns through a field called Artificial Intelligence, or AI. AI enables computers to see and understand the world by finding patterns in data. They analyze data to identify objects, much like you do when playing 'I Spy'."
3. Ask: "Can you think of any programs or apps that use AI for pattern recognition?" (Pause for student responses.)
	1. Examples could include:
		1. Unlocking your phone with facial recognition
		2. Interacting with smart assistants like Siri or Alexa
		3. Apps that suggest new songs based on your preferences

**Part 2: Introduction to Google Lens**

1. Say: "One of these AI tools is Google Lens, which helps identify things around you. This program uses AI to analyze patterns in data and images, then provides information about different objects. You can access Google Lens through the Google app on your phone."
2. Demonstrate Google Lens. Show a live Google Lens scan on your phone, projector-connected device, or screen recording.
3. Ask: "What patterns does the photo show that Google Lens might be using to figure out what is in the image?"
4. Say: "Google Lens isn’t just looking at these objects—it’s using machine learning! It compares patterns to millions of images and constantly improves its accuracy."
5. Say: “For instance, imagine you're on a nature walk and discover a beautiful flower you've never seen before. With Google Lens, you can take a picture and learn its name instantly. That’s the power of AI-driven pattern recognition!”

### **Do**

**Activity #1: Pattern Puzzle Challenge**

1. Say: "Who's ready for a challenge? We're going to play a game. I'll show you a series of images. Your job is to use pattern recognition to identify as many objects as you can in 3 minutes, and write your guesses on a piece of paper. Let's see who can name the most."
2. Display a series of images on the projector or distribute printed images. These could include unique plants, certain dog breeds, or unusual insects.
3. Say: "Take a good look at each image and write down exactly what you think the object is. If you're not sure, just give it your best guess."
4. Give the students 3 minutes to write their guesses.

**Activity #2: AI vs. Human: Who Knows Best?**

1. Provide each student with a device equipped with Google Lens.
2. Say: "Ready to become tech detectives? Use Google Lens to identify what's in the images and learn more about them. Let's see what interesting facts we can discover."
3. Instructions:
	1. Identify the item in each photo using Google Lens.
	2. Find at least three interesting facts about the item.
	3. Share one surprising thing you learned.
4. Have the students open Google Lens and use it to identify the objects in the images.
5. Give students 7–8 minutes to explore and identify the objects.
6. Say: "Alright, time's up! Let's discuss our findings. What did you learn about these objects?"
7. Lead a group discussion, encouraging students to share their findings and compare results. Highlight the differences and similarities in what they found.
8. Say: "Great job, everyone! Who managed to name the most objects correctly?" (Pause for responses.)
9. Say: "Google Lens is amazing, but did you notice any mistakes? That’s because AI isn’t perfect. It learns from data, and sometimes that data is wrong. That’s why we should always double-check our findings. AI tools like Google Lens are here to help us, but they don’t replace our own thinking and research."
10. Discuss the following questions:
	1. Did Google Lens ever give an incorrect answer?
	2. What did it struggle with? Were there any surprises?
	3. How can we make sure the information we find is accurate?

**Activity #3: What Can AI Find?**

1. Say: "Now, let's go on a pattern treasure hunt. We're going to find patterns everywhere we look!"
2. Divide students into small groups and give each group paper and a clipboard. Instruct them to find 10–15 patterns, which could include repeating shapes, colors, or textures.
3. Say: "Use Google Lens to help identify and learn more about the patterns you find.”
4. Optional: Have the students take pictures of the patterns to show the rest of the class."
	1. Examples:
		1. Repeating shapes on floor tiles
		2. Brick patterns on walls
		3. Stripes on clothing or backpacks
		4. Polka dots on bulletin boards or decorations
		5. Chevron patterns on posters or banners
		6. Checkered patterns on tablecloths or napkins
		7. Leaf patterns on indoor or outdoor plants
		8. Grid patterns on windows or doors
		9. Spiral patterns on notebooks or binders
		10. Repeating colors in a row of books
		11. Symmetrical shapes in art projects
		12. Repeating logos on sports equipment
		13. Geometric shapes on classroom rugs
		14. Animal print patterns on bags or accessories
		15. Wavy patterns on curtains or blinds
		16. Repeating letters or numbers on charts or posters
		17. Patterned tape on bulletin boards or desks
		18. Tessellation patterns in ceiling tiles
		19. Repeating star shapes on stickers or awards
		20. Repeated motifs on classroom wallpaper or borders
5. Have students explore the classroom or take a walk outside to discover patterns.
6. After exploration, have each group share their findings with the class.
7. Say: "Alright, treasure hunters, time to share your discoveries! Who found some cool patterns? Let's hear what you found and learned!"
8. Lead a discussion where each group shares their findings. Highlight any unique or surprising patterns they discovered.
9. Say: "Great job, everyone! Patterns are all around us, and you did an amazing job finding them."

**Activity #4: Using Google Lens in the Real World (Optional)**

1. Have a group discussion. Say: "Let's get creative! I want you to brainstorm other scenarios where Google Lens can be used as a tool."
	1. Ideas:
		1. **Plant Identification:** Use Google Lens to identify plants, flowers, and trees in your neighborhood or other places.
		2. **Identify Cat and Dog Breeds:** Snap a photo of a cat or dog, and the app will identify the specific breed. This works best for single breeds, not mixed breeds.
		3. **Insect and Bug Identification:** Take a photo to learn about different species and their habitats.
		4. **Recognizing Landmarks:** Use Google Lens while traveling to identify monuments and historical sites.
		5. **Language Translation:** Translate foreign text in books, menus, and signs instantly.
		6. **Animal Species Identification:** Identify various animals, making it a useful tool for biology classes or nature walks.
		7. **Famous Historical Figures:** Scan images of historical figures to access their biographical information.
		8. **Copy Text Easily:** Capture text from books, newspapers, or handwritten notes for research and note-taking.
		9. **Scan QR Codes and Barcodes:** Quickly retrieve information about products, advertisements, or educational materials.
		10. **Art History and Famous Paintings:** Use Google Lens to learn about artwork, sculptures, and their creators.

**Activity #5: Reflect & Apply**

We’ve explored patterns, technology, and AI tools—now, let’s think about what we discovered and how we can use it in real life.

**Reflect**

* How did using Google Lens change the way you look at objects around you?
* Can you describe a pattern you found and why it was interesting to you?
* What are some other ways AI can be used to help us recognize and analyze patterns?
* How did working in groups help you discover more patterns or learn new facts?
* What surprised you the most about the objects you identified?

## **Apply**

* How can you use Google Lens to identify plants in your backyard or at a park?
* Imagine you're traveling to a new country. How could AI tools like Google Lens help you navigate and learn about your surroundings?
* Discuss how AI-powered pattern recognition could be helpful in a grocery store.
* How might pattern recognition technology be used to help people with disabilities? (Examples: AI-powered text readers, visual aids for the visually impaired, or voice-to-text applications.)
* How do you think AI will continue to evolve in the future, and what kinds of new tools might we see?

### **Learning Objectives:**

Through this lesson, students will:

* Understand the concept of pattern recognition and its role in AI.
* Recognize and identify patterns in everyday objects and environments.
* Explain how artificial intelligence uses pattern recognition to analyze and classify objects.
* Learn how Google Lens applies AI and machine learning to provide information about the world.
* Apply pattern recognition through interactive activities, making connections to real-world AI applications.

**References and Resources**

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