

Using AI Agents for Research and Comparison

Examine cost and benefits, performance and effectiveness

Grade Level: Suitable for 6–12

Suggested Time: 1 Hour

Overview

Students explore how AI agents work by using Claude to conduct research, analyze comparative data, and generate an interactive HTML visualization. They choose two items to compare across five criteria, use structured prompting (BRIEF framework) to guide the AI, and critically evaluate the outputs. The lesson builds both technical fluency and the habit of treating AI as a tool that requires human direction and judgment.

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AI Learning Priorities

Humans and AI: Students practice directing, evaluating, and refining AI output, reinforcing that humans set goals, make judgments, and are responsible for the results AI produces.

Representation and Reasoning: Students observe how the AI interprets structured prompts to generate scored comparisons, and how choosing different visualization types changes how conclusions are perceived.

Machine Learning: Students see how a large language model draws on training data to produce research summaries and functional code, and why those outputs still require human verification.

Ethical AI: Students are prompted to fact-check AI claims and consider source credibility, surfacing the user's responsibility to verify before presenting AI-generated content as evidence.

Societal Impacts of AI: Real-world use cases ground students in how AI agents are already reshaping workflows across industries, making AI a present reality rather than a future concept.

Knowledge and Skills Topics

- What an AI agent is
- How to write structured, effective prompts to direct AI behavior
- How to critically evaluate AI-generated content for accuracy and bias
- How data can be visualized in multiple ways to communicate findings
- How to iterate on AI output through follow-up prompting and feedback

Materials and Resources Needed

- ☐ Student devices with a web browser and internet access. This works best on a laptop rather than a phone or tablet.
- ☐ Whitelisted items
 - ☐ [Claude.ai](#)

- [AI Agent Prompting](#)
- Students should already have Claude accounts set-up. There is no time allocated to do this during the lesson.

Curriculum Standards

- **ISTE 1.5.d Computational Thinker:** Students understand how automation works and use algorithmic thinking to develop a sequence of steps to create and test automated solutions.
- **ISTE 1.6.d Creative Communicator:** Students publish or present content that customizes the message and medium for their intended audiences.
- **CSTA 2-IC-20:** Compare tradeoffs associated with computing technologies that affect people's everyday activities and career options.
- **CSTA 3A-IC-24:** Evaluate the ways computing impacts personal, ethical, social, economic, and cultural practices.
- **AI4K12 Big Idea 2 – Representation & Reasoning :** Intelligent agents represent the world and use those representations to reason and make decisions.

Differentiation Suggestions

- For students who need support
 - Ensure students are in a group with supportive peers.
 - Provide a pre-filled comparison topic and criteria so they can focus on prompting and evaluating rather than choosing.
 - Walk through one full example as a class.
- For Multilingual Learners
 - Ensure students are in a group with supportive peers.
 - Allow topic selection in areas of personal interest or cultural familiarity.
- For students who are ready to go further
 - Ask them to fact-check at least two AI claims using external sources and document discrepancies.
 - Have them try the same comparison with completely different criteria and reflect on how results shift.
 - Encourage them to modify the generated HTML code directly.

Evidence of Understanding

- Students can explain in their own words what an AI agent does differently than a simple search engine
- Students produce a completed comparison spreadsheet with two items and five criteria
- Students successfully generate and can describe the AI research output
- Students generate an interactive visualization artifact and can identify at least one thing they would change or verify
- Students can articulate one decision they made that guided the AI toward a better result

Key Concepts

- AI Agent - software that plans steps, uses tools, and adjusts to complete a task
- Prompt - the input a human gives to guide AI behavior and output
- BRIEF Framework - a structured approach to writing clear, goal-oriented prompts
- Criteria - the specific dimensions used to evaluate and compare items fairly
- Artifact - in this context, the interactive HTML visualization generated by the AI
- Iteration - refining AI output through follow-up prompts and feedback
- Verification - the process of checking AI-generated claims against other sources

Activity Overviews

Activity #1: Design Your AI Agent

Purpose: Design the research your agent will run.

Task: Students will select two items to compare and then select five criteria to compare them on using Claude (claude.ai). The spreadsheet they use will build a BRIEF prompt for them which will be used in activity #2.

Activity #2: Put Your Agent To Work

Purpose: Review the output of your prompt.

Task: Students will have 10 minutes to evaluate the research output and determine the quality of the information gathered. Students will decide what makes a strong result.

Activity #3: Create An Interactive Artifact

Purpose: Prompt Claude to generate an artifact based on the comparison in activity #2.

Task: Students will type a provided prompt and fill in the project title, color scheme, and font. Claude will generate an interactive artifact that students can click on, hover over, and toggle between different views. Students should interact with it, then iterate to make sure everything works the way they want it to.

Sequence, Session Flow, and Facilitation Prompts

Sequence

1. Opening & Hook
2. AI Agents
3. Activity #1 - Design Your AI Agent
4. Debrief - Activity #1
5. Activity #2 - Put Your Agent to Work
6. Debrief - Activity #2
7. Activity #3 - Create An Interactive Artifact
8. Debrief & Share-out
9. Wrap-Up

Session Flow

1-Hour Class Period

Opening & Hook	0:00 - 0:03	Slides 1-2; Low stakes, engagement
AI Agents	0:03 - 0:11	Slide 3-5; Direct instruction
Activity #1	0:11 - 0:23	Slides 6-7
Activity #2	0:23 - 0:34	Slides 8-9
Debrief - Activity #2	0:34 - 0:39	Slide 10

Activity #3	0:39 - 0:52	Slides 11-12
Debrief - Activity #3	0:52 - 0:57	Slide 13
Wrap-Up	0:57 - 1:00	Slides 14-15

45-Minute Class Period

Opening & Hook	0:00 - 0:03	Slides 1-2; Low stakes, engagement
AI Agents	0:03 - 0:11	Slide 3-5; Direct instruction
Activity #1	0:11 - 0:23	Slides 6-7
Activity #2	0:23 - 0:33	Slides 8-9 then SKIP to SLIDE 11
Activity #3	0:33 - 0:43	Slides 11-12 then SKIP to SLIDE 14
Wrap-Up	0:43 - 0:45	Slides 14-15

Facilitation Prompts

[SLIDE DECK](#)

SLIDE 1 - Title Slide

Say "How many of you have asked Siri, Google Assistant, or Alexa to do something for you this week? [pause for hands]

Perfect. Keep that in mind."

SLIDE 2 - Think About It

Say "You tell Siri - remind me about [something].

Simple, right? But here's what actually happened. Siri set a reminder. Checked your calendar to make sure you weren't already busy. Texted your friend.

Now - and I want you to actually think about this - Did YOU do those things? Or did the AI?

[Pause. Let it sit for a few seconds before taking answers.]

Here's what's interesting about this. A lot of people would say "I did it" - because they started it. But did they actually do the tasks or did they AI? That gap - between starting something and doing something - is exactly what we're exploring today.

SLIDE 3 - What is an AI Agent?

Say "Not all AI is the same.

Let's start with a chatbot. You've used these. You ask a question, it answers, and you're done. One exchange. Think of it like texting someone and waiting for a reply.

Then there are AI agents. This is different. When you give it a goal, it doesn't just answer - it plans. It figures out what steps it needs to take. Then it acts - it might search the web, write code, generate content. Then it checks what it got back. And if it didn't get what it needed, it tries again.

That loop - plan, act, check, adjust - is what makes something an agent. It's not waiting for your next message. It's working.

Here's an analogy. A chatbot is like asking a friend a question. An AI agent is like hiring an intern. The intern takes your goal, figures out how to accomplish it, and comes back with results - and they don't need you to hold their hand every step of the way.

Claude - which you're going to use today - is an AI agent. And that means it's capable of doing something much more interesting than just answering questions.

SLIDE 4 - Choosing Your AI Agent

Say "So if AI agents are powerful, why doesn't everyone just use the same one?

Because different tools have different strengths. Look at these four.

Claude - which is what we're using today - is particularly good at deep research, writing code, and building interactive things like the visualization you're going to create in Activity 3. It's what we want when we need something that can think through a complex task and produce something usable.

Perplexity is strong for real-time web research - if you need something that happened this week, Perplexity will search the web and cite its sources for you.

Canva AI is designed for visual outputs. If you need something that looks polished, Canva's design tools are hard to beat.

ChatGPT is great for general tasks - brainstorming, conversation, quick drafts.

The sophisticated play, using AI most effectively, is using Claude for the research, passing the data to Canva for the visual, and using something else for the write-up. Strategically layering agents.

Today, we're staying in Claude. But now you know there's a bigger toolkit available.

If a student asks 'why Claude and not ChatGPT?' Say: 'Different tools make different trade-offs. Claude tends to follow complex instructions carefully and is particularly strong at writing code - which is exactly what Activity 3 needs. It's not a competition, it's about capabilities.'

SLIDE 5 - The BRIEF framework

Say "Before we start activity 1 let's review the BRIEF framework for writing prompts.

B is for Background. This is the context you give the AI - who you are, what you're doing, why it matters. Without this, the AI has no frame of reference. Can you give me a few examples of background? *(listen for age, location, gender, or similar)*

R is for Role. This is you telling the AI who to be. 'Act as a business analyst.' 'Act as an environmental scientist.' When you assign a role, you change how the AI reasons about the problem. What are some examples of a role you might use? *(listen for types of jobs that people have)*

I is for Input. What data must the AI use? In our case, that's your two items and your five criteria. The AI can only work with what you give it.

E is for End Goal. What does a great answer actually look like? Not just 'compare them' - be specific. A scored table, ranked by criterion, with sources.

F is for Format. How should it be presented? Table, paragraph, bullet points? In plain language or technical? This is the difference between getting something you can use and something you have to reformat.

When you put all five together, you're not just asking AI a question. You're giving it a complete job brief. That's what makes agents save you time and give you high quality results.

SLIDE 6 - Activity 1

Say "You will be replacing the highlighted items with values that make sense for your group. This prompt will help us with activities 2 and 3. You will ONLY type/replace the highlighted text because the rest of the BRIEF prompt is prepared for you!

SLIDE 7 - Activity 1

Say "Get into groups of 3-4. (Pause.)

We're going to do three activities today, and they build on each other. This first one sets everything up.

Your goal is to design the research your AI agent will run. You're going to choose two items to compare and then choose five criteria to compare them on.

Open the [AI Agents Prompting document](#) and make a copy for your group. Then work on filling in/replacing your two items and your five criteria.

SLIDE 8 - Put Your Agent To Work

Say "Now we're going to actually send that prompt to Claude and see what comes back.

This is an example of what you might see.

SLIDE 9 - Activity 2

Open [claude.ai](#) and sign in with your school account. If you've never used Claude before, the interface is simple - you type in the box at the bottom and hit enter.

Copy your BRIEF prompt from the gray section of the document. Paste it into Claude. Press enter

Here's your job while you're reading the response: be skeptical. Look for the things on the right side of the slide. Are the scores believable? Does a claim seem too strong? Is there data that feels outdated? If you find something that feels off, don't just accept it - push back. Type something like: "Verify the data you used for [criterion]" or "Find more recent information on [item]."

Iteration is the skill here. Your first output is not your final output.

SLIDE 10 - Debrief

Say "What did Claude get right? And what did you actually have to question or correct?"

Claude tends to be strong on factual, measurable things - revenue, market data, technical specs - and weaker on anything that requires judgment or recent context. That's not a flaw; that's how it works.

Did your follow-up questions actually change the output? What specifically changed?

This is a key insight from this activity. Claude doesn't just respond to your first prompt - it responds to the entire conversation. Every message you send is additional context. The more specific your follow-up, the better your result.

How could you tell if Claude was being confidently wrong? What did it look like?

This is hard. Claude doesn't say "I'm not sure about this." It just says it. That's called hallucination - and it's one of the most important things to understand about working with AI. The output sounds correct even when it isn't. Which is why you always verify before presenting anything as evidence.

SLIDE 11 - Create an Interactive Artifact

Say "Last activity. Now we're going to ask Claude to do something that goes beyond text - we're going to ask it to build an interactive visualization of your comparison.

This is an example of what it might generate.

SLIDE 12 - Activity 3

On the left side of the slide, you'll see the prompt template. Before you send it, you need to fill in three things: your project title, your color scheme, and your font. Be deliberate about these - the artifact will look exactly like what you specify.

Once you send it, Claude will generate HTML code and render it in the interface. You'll be able to click on it, hover over data points, and toggle between different views.

Your job is to interact with it first, then iterate. Hover over the bars. Click the toggle. Does everything work? Does something look wrong or confusing? If so, give Claude specific feedback. 'Make the bars horizontal.' 'Add a title to the legend.' Vague feedback like 'make it better' will not help.

If something breaks entirely, just type: 'Rebuild the entire artifact from scratch.' That usually solves it.

SLIDE 13 - Debrief

Say "Who wants to walk us through what they built? You've got about 30 seconds. Tell us what you compared and what the visualization shows.

Did the visualization change how you read the comparison? Did seeing it visually make you think about it differently than when it was just a table of scores?

Visualization does something interesting - it takes abstract data and makes it immediately emotional. A tall bar feels more significant than the number 87. It's not more accurate; it's just more persuasive. Which means we have to be careful about what we're building and why.

[If time allows] What specific feedback did you give Claude to improve it? What changed?

Slide 14 - What is an AI Agent?

Say "I want to go back to the first question I asked you today about Siri doing tasks. Agents do a lot. But so do you.

What AI agents can do. Search and synthesize vast information. Generate and iterate on code and visuals. Run the same task a thousand times without fatigue. Complete routine multi-step workflows.

What only you can do. Decide what question matters. Judge whether the output is trustworthy. Bring real-world context and values. Take responsibility for the result.

Here's what I want you to sit with for a second. Look at both columns. The left column is getting longer every year. Fast. The right column is not getting shorter. And the value of the right column - in a world where the left column keeps expanding - is going up, not down.

Today you used Claude to research, analyze, and build something. But you decided what to compare. You decided what questions to ask. You decided what to push back on. That's the work that actually matters.

SLIDE 15 - Reflection

Say "The AI did the research, built the visualization, and wrote the code.

What did you contribute today?

Does that answer make you feel confident or nervous?

I'm not looking for an answer to this one right now. I just want you to hold it. There's no right response - confident is fine, nervous is fine, both at the same time is probably the most honest answer.

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