



# Drone Exploring: Career Spotlights

Cartography — Club

**Overview:** Cartographers are mapmakers, and drones have made it much faster to turn aerial photos into accurate, useful maps. In this session, youth explore how a drone's photos become a map, practice reading and using map symbols, and create their own simple map of a nearby space complete with a legend.

## OBJECTIVES

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- Introduce youth to the career of cartography and how drones help create modern maps.
- Explain the basic idea of turning aerial photos into a map with symbols and scale.
- Practice reading and creating map symbols and legends.
- Build a simple map of a real space through a hands-on activity.

## SUPPLIES

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- Flip chart or whiteboard and markers
- A sample map with a legend (local park map, campus map, or trail map)
- Graph paper, pencils, and rulers for map-making
- Optional: a printed aerial or satellite image of the meeting space or schoolyard
- Printed handouts: How a Drone Photo Becomes a Map and Make Your Own Map

## ADVISOR NOTES

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- If a real aerial image of the space isn't available, have youth sketch their map from memory or a quick walk-through instead.
- Emphasize that a good map needs a scale (so distances make sense) and a legend (so symbols are clear to anyone reading it).
- Keep the mapped area small and simple — a room, yard, or small section of the meeting space works well.
- Consider inviting a guest speaker (a GIS professional, surveyor, or local mapping company employee) to share how real maps get made. See Optional Extensions.
- If no guest speaker is available, Advisors can run the entire session using this outline and the resource links below.

## SESSION OUTLINE

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- **Welcome and Icebreaker** (10 min)
  - "Map Memory:" Ask youth to describe how they'd give directions to a friend without using a map, then imagine how much easier it would be with one.
- **Safety Moment (Accurate Maps Keep People Safe)** (10 min)
  - Inaccurate maps can send emergency responders, hikers, or drivers to the wrong place.
  - Careful, accurate data collection matters just as much as making the map look nice.
  - Ask: "Can you think of a time a wrong map or set of directions caused a problem?"
- **Mini-Lesson: How a Drone Photo Becomes a Map** (15 min)
  - Explain that drones fly a grid pattern, taking overlapping photos that special software stitches into one large, accurate image called a map.
  - Show a sample map and point out symbols, a legend, and a scale bar.
- **Activity: Symbol Scavenger Hunt** (15 min)
  - Using a sample map, teams identify what different symbols represent (trees, buildings, water, trails) using the legend.

- Discuss why symbols make maps easier to read than words alone.
- **Activity: Make Your Own Map** (20 min)
  - Using the Make Your Own Map handout, small groups sketch a simple map of the meeting space or schoolyard.
  - Groups create their own symbols and a legend, then add a simple scale.
- **Wrap-Up Share-Out** (10 min)
  - Groups trade maps and see if they can navigate using someone else's legend and symbols.

## REFLECTION SECTION

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*Advisor Note: Some sample questions are below. They are designed to help the participants apply what they have learned to their own interests. You are welcome to use these questions or develop your own.*

### Focusing Questions

- What was tricky about creating your own map symbols?
- What do you think makes a map easy or hard to read?

### Analysis Questions

- Why do mapmakers need a legend and a scale, not just a picture?
- How does taking many overlapping photos help create a more accurate map?

### Generalization Questions

- Where else do you use maps or symbols to understand information quickly, besides geography?
- What's one place you'd like to make a map of next?

**Challenge: This week, look at a map you use often (a mall map, video game map, or school map) and find its legend and scale.**

## OPTIONAL EXTENSIONS

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**Guest Speaker:** Invite a GIS professional, surveyor, or local mapping company employee to share how real maps get made using drones, in person or by video call.

**Advisor-Led Option:** If a guest speaker isn't available, Advisors can run this session using the outline above and the resource links below. No outside expert is required.

**Resource Links:** search "how drone mapping works" on a video platform for kid-friendly explainer videos.

**Group Extension:** Create a treasure-hunt map of the meeting space using your own symbols and challenge another group to follow it.

# Handout: How a Drone Photo Becomes a Map

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*Read through the steps below before starting the mapmaking activity.*

## **Step 1: Flight Planning**

A drone flies a grid pattern over an area, taking photos that overlap with each other.

## **Step 2: Stitching**

Special software lines up all the overlapping photos into one large, seamless image.

## **Step 3: Adding Symbols and a Legend**

Mapmakers add symbols for features like trees, buildings, or trails, along with a legend explaining what each symbol means.

## **Step 4: Adding a Scale**

A scale bar shows how a distance on the map compares to real-world distance, so users can judge how far things really are.

## Handout: Make Your Own Map

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Sketch a simple map of your assigned space below (use a separate sheet if needed). List at least 4 symbols you used and what each one means.

| Symbol | What It Means |
|--------|---------------|
|        |               |
|        |               |
|        |               |
|        |               |