



Drone Exploring: Career Spotlights

Mining — Club

Overview: Mining sites use drones to measure giant piles of rock or dirt, check on huge open pits, and keep workers away from unstable or dangerous areas. In this session, youth learn how drones support mining operations and practice a hands-on stockpile estimator activity, comparing how accurately they can guess a pile's size versus measuring it carefully.

OBJECTIVES

- Introduce youth to the career of using drones to support mining operations.
- Explain how drones measure stockpiles and check unstable areas without putting workers at risk.
- Practice estimating and measuring the volume of a pile through a hands-on activity.
- Build awareness of mining safety and why keeping workers away from unstable slopes matters.

SUPPLIES

- Flip chart or whiteboard and markers
- A pile of sand, blocks, or crumpled paper to represent a mining stockpile
- Measuring tape or rulers
- Printed handouts: How Drones Help at Mining Sites and Stockpile Estimator

ADVISOR NOTES

- Emphasize that mining sites can have unstable slopes or pits, and drones let inspectors check these areas without anyone walking into danger.
- Keep the stockpile activity simple: Focus on comparing an eyeballed guess to an actual measurement, rather than precise volume math (unless your group is ready for it).
- Discuss how mining companies use accurate stockpile measurements to track how much material they've mined or need to move.
- Consider inviting a guest speaker (a mining surveyor, safety officer, or drone survey technician in the mining industry) to share their work. 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

- **Welcome and Icebreaker** (10 min)
 - “Guess the Pile:” show a pile of material and ask youth to guess how big it is before any measuring happens.
- **Safety Moment (Why Mining Sites Are Dangerous to Walk Into)** (10 min)
 - Mining sites can have unstable slopes, deep pits, and heavy equipment moving around.
 - Drones let inspectors check dangerous areas from a safe distance.
 - Ask: “Why do you think mining companies are excited about tools that reduce how often workers enter risky areas?”
- **Mini-Lesson: How Drones Help at Mining Sites** (15 min)
 - Explain how drones measure the size (volume) of stockpiles of rock, ore, or dirt much faster and more accurately than estimating by eye.
 - Discuss how drones also check slopes and walls of a mine for signs of instability that could put workers at risk.
- **Activity: Stockpile Estimator Challenge** (20–25 min)
 - Show a pile of sand, blocks, or crumpled paper representing a mining stockpile.

- Teams write down their best guess of the pile's size, then carefully measure its height, width, and length using tape or rulers.
- Record guesses versus actual measurements on the Stockpile Estimator handout and compare accuracy.
- **Discussion: Why Accuracy Matters for a Business** (10 min)
 - Discuss why a mining company would want an accurate measurement rather than just a rough guess, especially when material is valuable.
- **Wrap-Up Share-Out** (10 min)
 - Groups share how close their guesses were to the actual measurements and discuss how a drone scan could do this even more precisely.

REFLECTION SECTION

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

- How close was your team's guess to the actual measurement?
- What surprised you about how hard it is to estimate a pile's size just by looking at it?

Analysis Questions

- Why would a mining company want a precise measurement instead of a rough guess?
- How could a drone measure a stockpile more safely than a person walking around it with a tape measure?

Generalization Questions

- Where else in life is it useful to measure something precisely instead of just guessing?
- What's one thing you'd like to learn next about how mining or construction materials get measured?

Challenge: This week, guess the size of something around your house (a pile of laundry, a stack of books) and then actually measure it to see how close you were.

OPTIONAL EXTENSIONS

Guest Speaker: Invite a mining surveyor, safety officer, or drone survey technician in the mining industry to share their work, 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 "drone stockpile measurement mining" on a video platform for kid-friendly explainer videos.

Group Extension: Build two different-shaped piles with the same amount of material and discuss how you'd measure and compare their volumes.

Handout: How Drones Help at Mining Sites

Mining — Club

Read through the key ideas below before starting the Stockpile Estimator Challenge.

Stockpile Volume Measurement

Drones fly over piles of rock, ore, or dirt and use photos to calculate an accurate volume, much faster than measuring by hand.

Slope and Pit Safety Checks

Drones inspect the walls and slopes of a mine for cracks or instability that could put workers at risk.

Tracking Progress

Regular drone surveys help mining companies track how much material has been moved or mined over time.

Why It Matters

Accurate measurements help companies plan and stay safe, since mined material is valuable and mining sites can be hazardous.

Handout: Stockpile Estimator

Mining — Club

Record your team's guess, then your actual measurements, for the stockpile.

Measurement	Our Guess	Actual Measurement
Height		
Width		
Length		