

SAVE THE SAMPLE: Mission Challenge

MISSION BRIEFING

You have a tiny sample of important biological material. Your mission: Transfer it accurately to multiple tubes without losing or wasting a single drop. Precision is everything. Time is ticking. Good luck, scientist!

Name: _____ Date: _____

Pair/Group Number: _____ Mission Start Time: _____

Challenge Rules & Safety

- ✓ You have one precious sample to transfer
- ✓ Every drop counts—no waste allowed
- ✓ Maintain accuracy across ALL transfers
- ✓ Follow micropipette safety rules:
 - Never force the plunger
 - Keep tips clean and dry
 - Handle with care
- ✓ **Success = Accurate transfer with ZERO drops lost**

SAVE THE SAMPLE Challenge Station (10-12 minutes per pair)

Mission Objective

Accurately transfer your target volume from the original sample to three new tubes without losing or wasting any material.

Pre-Challenge Prediction

Target volume to transfer: _____ μL

How many transfers will you make? _____

Predict: Will you successfully complete all transfers?

- ☐ Yes
- ☐ No

Why do you think so?

Challenge Execution Log

Transfer #	Target Volume (μL)	Actual Volume Transferred (μL)	Accuracy (Match? Yes/No)	Notes/Observations
1			☐ Yes ☐ No	
2			☐ Yes ☐ No	
3			☐ Yes ☐ No	

Post-Challenge Reflection

Did you successfully transfer the target volume?

- ☐ Yes
- ☐ No

How do you know? (What evidence do you have?)

What was the most challenging part?

If you could do it again, what would you do differently?

How does this challenge connect to real scientific work?

Challenge Status

- ☐ **MISSION ACCOMPLISHED:** All transfers accurate, zero drops lost!
- ☐ **MISSION PARTIAL:** Some transfers accurate
- ☐ **MISSION IN PROGRESS:** Need more practice

CER Activity: Claim-Evidence-Reasoning (15 minutes)

The Scientific Claim

CLAIM: "Scientists should use micropipettes instead of pouring when measuring small volumes."

EVIDENCE

Provide observations from the color-mixing and sample transfer challenges:

From Color-Mixing Challenge:

- What did you observe about the accuracy of your color predictions?
- How consistent were your results across all three stations?

From Save the Sample Challenge:

- What happened when you used the micropipette for precise transfers?
- What would have happened if you had poured the liquid instead?

List your evidence (3-4 specific observations from both activities):

1. *List*

2. *List*

3. *List*

4. *List*

REASONING

Explain WHY precision matters in scientific investigation:

- Why is accuracy important when studying cells or other biological materials?
- What could go wrong in a real scientific experiment if measurements were not precise?
- How does using a micropipette help scientists get reliable results?

Evaluate - Exit Ticket (8 minutes)

Final Challenge Question

"Why would a scientist use a micropipette instead of pouring liquid when studying cells? Explain your thinking."

Think about:

- What you learned from all three days of activities
- Why precision matters in science
- What would happen without precise measurement tools

Your Answer:

Reflection & Celebration

You did it! You completed the three-day micropipette challenge! 🎉

What was your favorite part of this lesson?

What's one thing you learned about precision and scientific measurement?

If you could be a scientist using micropipettes, what would you want to study?

Congratulations, Scientist! You have successfully completed your mission! 🧪 ✨