

Mix, Filter, Recover

Trace a physical-change investigation from mixture to separated materials.

S5P1.a "Plan and carry out investigations of physical changes by manipulating, separating and mixing dry and liquid materials."

NAME _____

DATE _____

1 READ AND MARK _____ Read it twice

YOUR JOB Circle every material named in the passage, and underline each sentence that describes mixing or separating materials.

Separating a Three-Part Mixture

- ① An investigation can show that a mixture is not the same as a new substance. Ms. Chen's class planned to separate a snack-sized mixture of table salt, sand, and water. Salt and sand were dry solids before the test. Water was the liquid. The class used equal amounts of salt and sand so another group could repeat the investigation.
- ② First, students poured the water into a clear cup and added the salt. They stirred until the salt was no longer visible, although it was still in the water. Next, they added the sand and stirred again. The sand did not dissolve. It settled on the bottom after the cup sat still. These observations helped the class choose separation methods.
- ③ To separate the mixture, students poured it through a coffee filter into a second cup. The filter trapped the sand, while salt water passed through. They placed the salt water in a shallow dish and left it where water could evaporate safely. When the water changed into water vapor, salt crystals remained. No new substances formed during mixing or separating.

2 ANSWER WITH EVIDENCE Use the passage

1 Which two materials were dry solids before the test, and which material was the liquid?

2 What observation showed that salt and sand needed different separation methods?

3 How did the coffee filter separate one material from the mixture?

4 After filtering, what did students do to recover the salt, and what remained?

3 YOUR TURN Your own words

Plan a safe investigation using one dry material and water. Fill in the table to show how you will mix the materials, separate them, and predict what you will observe. After teacher approval, actually perform your plan. A feasible test uses 1 tablespoon dry rice and 100 mL room-temperature water: stir 10 seconds, then pour through a strainer whose holes are smaller than the grains into a second bowl. On extra paper record the materials before mixing, what you observe during mixing, and what remains in each place after separation. Compare your observations with your prediction and explain why this was a physical change.

PLAN PART	YOUR PLAN

PART 1 • READ AND MARK

Circle every material named in the passage, and underline each sentence that describes mixing or separating materials. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	Which two materials were dry solids before the test, and which material was the liquid?	Salt and sand were dry solids. Water was the liquid.
2	What observation showed that salt and sand needed different separation methods?	Salt was no longer visible but was still in the water. Sand did not dissolve and settled on the bottom.
3	How did the coffee filter separate one material from the mixture?	The coffee filter trapped the sand while the salt water passed through into the second cup.
4	After filtering, what did students do to recover the salt, and what remained?	They put the salt water in a shallow dish and let the water evaporate. Salt crystals remained.

PART 3 • YOUR TURN (SAMPLE ANSWER)

PLAN PART	YOUR PLAN
Question	How can I separate rice from water after mixing them?
Materials	Dry rice, water, a bowl, a strainer, and a second bowl
Steps	Pour water over rice in the bowl, stir for 10 seconds, then pour the mixture through the strainer over the second bowl.
Prediction	Rice will stay in the strainer, and water will collect in the second bowl.

Accept answers that accurately use the passage's observations and separation steps. For the open task, accept safe plans that name a dry material and water, include mixing and a workable physical separation method, and give a reasonable prediction. Teacher supplies dry rice, measuring spoon/cup, two plastic bowls, suitable strainer and extra records paper; check hole size and approve the plan before use. Do not taste materials; wipe spills and wash hands. Observe actual measuring/mixing/pouring/separating and require three before/during/after records. Accept other teacher-approved dry materials with workable physical separation. Expected rice example: separate dry grains and water, grains in water during mixing, grains retained while water passes through. Minor water on retained grains is normal. Require actual result versus prediction and explanation that mixing/separation changed arrangement, not created a new substance. The printed rice sample is a plan, not the learner's result. Original salt/sand/filter/evaporation source and all four supported keys remain; no boiling or heating is needed for the added rice trial.