

Separating by Size & State

Filter Mill with Mixling

Learning target

Choose a separation method suited to component properties.



Before you begin

Use the reference page and discussion prompts on their own, or open the optional browser adventure. No earlier lesson or physical kit is required.

For online play: use an internet-connected current browser with local storage enabled. Read the three-part Gemling briefing, answer the quick check, and apply the evidence at three checkpoints. Retry feedback supports review; results are not a secure test or gradebook.

Use for teacher-led review, science centers or partner practice. Independent readers may need support with the vocabulary below. The design target is grades 3-5; choose support based on the learner.

Vocabulary and concepts to discuss

Sieving; filtration; settling; evaporation

Open Filter Mill - direct lesson link

Scan the QR code or use the clickable link. This guide is usable offline; the adventure runs on an external educational website.



Separating by Size & State - key ideas

1. The first clues

Separation methods use differences in properties. Sieves separate suitable particle sizes; filters can trap undissolved particles; settling allows some particles to fall out.

2. How the clues connect

Ordinary filters do not remove dissolved salt from water. Evaporation can leave the salt behind as water enters the air.

3. Our evidence record

Our mixture contains sand and salt water. Filtering removes the sand, while the dissolved salt remains in the filtrate. A later evaporation step can recover salt.

Keep the science accurate

Ordinary filtering does not remove a dissolved substance such as salt from water.

Apply the evidence

Use a specific observation from this lesson to explain one choice. Point to a clue, then connect that clue to a scientific idea.

Curriculum reference: <https://www.nextgenscience.org/dci-arrangement/5-ps1-matter-and-its-interactions>

Talk through the evidence

1. What does the filter remove in our model?

Expected answer: Undissolved sand

Reasoning: Our mixture contains sand and salt water. Filtering removes the sand, while the dissolved salt remains in the filtrate. A later evaporation step can recover salt.

2. What remains dissolved after filtering?

Expected answer: Salt

Reasoning: Our mixture contains sand and salt water. Filtering removes the sand, while the dissolved salt remains in the filtrate. A later evaporation step can recover salt.

3. Which step can leave salt behind?

Expected answer: Evaporating water

Reasoning: Ordinary filters do not remove dissolved salt from water. Evaporation can leave the salt behind as water enters the air.

4. Why select methods by properties?

Expected answer: Different components separate in different ways

Reasoning: Separation methods use differences in properties. Sieves separate suitable particle sizes; filters can trap undissolved particles; settling allows some particles to fall out.

Guide the discussion

Ask learners to name the evidence that supports their answer. If an answer differs, revisit the matching key idea on page 2 and invite a revised explanation.

Online rewards: this lesson grants one fixed digital Expedition Discovery. Five saved digital Gemling friends become available only after all six distinct subject lessons are complete, in any order. Digital rewards do not establish physical ownership.