***Uncovering Student Ideas* Probe Collections- Grade 4\***

**LIFE SCIENCE**

**LS1.A Structure and Function**

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| **Name of Probe** | **Source** | **Concepts addressed** |
| Apple Tree  (can be modified for gr. 4) | [*Uncovering Student Ideas in Life Science- Vol. 1*](https://www.uncoveringstudentideas.org/books/formative-assessment-probes/uncoveringstudentideas-lifescience-volume1) | food, leaves, photosynthesis |
| Rocky Soil | [*Uncovering Student Ideas in Life Science- Vol. 1*](https://www.uncoveringstudentideas.org/books/formative-assessment-probes/uncoveringstudentideas-lifescience-volume1) | roots, plant behavior, tropism |
| Plants in the Light and Dark | [*Uncovering Student Ideas in Science- Vol. 2*](https://www.uncoveringstudentideas.org/books/formative-assessment-probes/uncoveringstudentideas-volume2) | growth, food storage structures |
| Is It Living? | [*Uncovering Student Ideas in Science- Vol. 1*](https://www.uncoveringstudentideas.org/books/formative-assessment-probes/uncoveringstudentideas-volume1) | concept of living |
| Additional probes will be added to this DCI when *Uncovering Student Ideas in Life Science- Vol. 2 is released in 2023.* | | |

**LS1.D Information Processing**

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| **Name of Probe** | **Source** | **Concepts addressed** |
| Probes will be added to this DCI when *Uncovering Student Ideas in Life Science- Vol. 2 is released in 2022.* | | |

**EARTH AND SPACE SCIENCE**

**ESS1.C The History of Planet Earth**

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| **Name of Probe** | **Source** | **Concepts addressed** |
| Mountaintop Fossil | [*Uncovering Student Ideas in Science- Vol. 2*](https://www.uncoveringstudentideas.org/books/formative-assessment-probes/uncoveringstudentideas-volume2) | fossils, uplift, mountain formation |
| Is It a Fossil? | [*Uncovering Student Ideas in Earth and Environmental Science*](https://www.uncoveringstudentideas.org/books/formative-assessment-probes/uncoveringstudentideas-earth-and-environmental-science) | Fossils |
| Mountain Age | [*Uncovering Student Ideas in Science- Vol. 1*](https://www.uncoveringstudentideas.org/books/formative-assessment-probes/uncoveringstudentideas-volume1) | Mountain formation, uplift, weathering |
| What’s Beneath Us? | [*Uncovering Student Ideas in Earth and Environmental Science*](https://www.uncoveringstudentideas.org/books/formative-assessment-probes/uncoveringstudentideas-earth-and-environmental-science) | Earth’s crust |

**ESS2.A Earth Materials and Systems**

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| **Name of Probe** | **Source** | **Concepts addressed** |
| Beach Sand | [*Uncovering Student Ideas in Science- Vol. 2*](https://www.uncoveringstudentideas.org/books/formative-assessment-probes/uncoveringstudentideas-volume2) | weathering, erosion, deposition |
| Is It a Rock? Part 1 and 2 | [*Uncovering Student Ideas in Science- Vol. 2*](https://www.uncoveringstudentideas.org/books/formative-assessment-probes/uncoveringstudentideas-volume2) | Earth materials, rocks, rock sizes |
| Is It Erosion? | [*Uncovering Student Ideas in Earth and Environmental Science*](https://www.uncoveringstudentideas.org/books/formative-assessment-probes/uncoveringstudentideas-earth-and-environmental-science) | weathering, erosion, deposition |
| How Do Rivers Form? | [*Uncovering Student Ideas in Earth and Environmental Science*](https://www.uncoveringstudentideas.org/books/formative-assessment-probes/uncoveringstudentideas-earth-and-environmental-science) | erosion, river systems |
| Mountains and Beaches | [*Uncovering Student Ideas in Earth and Environmental Science*](https://www.uncoveringstudentideas.org/books/formative-assessment-probes/uncoveringstudentideas-earth-and-environmental-science) | weathering, erosion, deposition |
| Can a Plant Break Rocks? | [*Uncovering Student Ideas in Earth and Environmental Science*](https://www.uncoveringstudentideas.org/books/formative-assessment-probes/uncoveringstudentideas-earth-and-environmental-science) | Weathering |
| What Do You Know About Soil? | [*Uncovering Student Ideas in Earth and Environmental Science*](https://www.uncoveringstudentideas.org/books/formative-assessment-probes/uncoveringstudentideas-earth-and-environmental-science) | Soil, Earth materials |

**ESS2.E Biogeology**

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| **Name of Probe** | **Source** | **Concepts addressed** |
| Can a Plant Break Rocks? | [*Uncovering Student Ideas in Earth and Environmental Science*](https://www.uncoveringstudentideas.org/books/formative-assessment-probes/uncoveringstudentideas-earth-and-environmental-science) | Weathering by plants |

**ESS2.B Plate Tectonics and Large-Scale System Interactions**

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| **Name of Probe** | **Source** | **Concepts addressed** |
| What Do You Know About Volcanoes and Earthquakes?  (can be modified for gr. 4) | [*Uncovering Student Ideas in Earth and Environmental Science*](https://www.uncoveringstudentideas.org/books/formative-assessment-probes/uncoveringstudentideas-earth-and-environmental-science) | volcanoes, earthquakes |

**ESS3.A Natural Resources**

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| **Name of Probe** | **Source** | **Concepts addressed** |
| Where Does Oil Come From? | [*Uncovering Student Ideas in Science- Vol. 4*](https://www.uncoveringstudentideas.org/books/formative-assessment-probes/uncoveringstudentideas-volume4) | fossil fuels, nonrenewable resource, natural resource |
| Renewable or Nonrenewable?  (can be modified for gr. 4) | [*Uncovering Student Ideas in Earth and Environmental Science*](https://www.uncoveringstudentideas.org/books/formative-assessment-probes/uncoveringstudentideas-earth-and-environmental-science) | natural resources, renewable resources, nonrenewable resources |

**ESS3.B Natural Hazards**

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| **Name of Probe** | **Source** | **Concepts addressed** |
| What Do You Know About Volcanoes and Earthquakes?  (can be modified for gr. 4) | [*Uncovering Student Ideas in Earth and Environmental Science*](https://www.uncoveringstudentideas.org/books/formative-assessment-probes/uncoveringstudentideas-earth-and-environmental-science) | volcanoes, earthquakes |

**PHYSICAL SCIENCE**

**PS3.A Definitions of Energy**

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| **Name of Probe** | **Source** | **Concepts addressed** |
| No probes available yet for this DCI at this grade level. Probes will be added to this section when new books come out. | | |

**PS3.B Conservation of Energy and Energy Transfer**

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| **Name of Probe** | **Source** | **Concepts addressed** |
| How Can You Light the Light Bulb? | [*Uncovering Student Ideas about Magnetism and Electricity*](https://www.uncoveringstudentideas.org/books/formative-assessment-probes/uncoveringstudentideas-physicalscience-electricity-and-magnetism) | current, circuit, transfer of energy |
| Where Do I Put the Switch? | [*Uncovering Student Ideas about Magnetism and Electricity*](https://www.uncoveringstudentideas.org/books/formative-assessment-probes/uncoveringstudentideas-physicalscience-electricity-and-magnetism) | current, circuit, transfer of energy |
| Mixing Water | [*Uncovering Student Ideas in Science- Vol. 2*](https://www.uncoveringstudentideas.org/books/formative-assessment-probes/uncoveringstudentideas-volume2) | heat, transfer of energy |
| Mitten Problem | [*Uncovering Student Ideas in Science- Vol. 1*](https://www.uncoveringstudentideas.org/books/formative-assessment-probes/uncoveringstudentideas-volume1) | Heat, temperature, transfer of energy |

**PS3.C Relationship Between Energy and Forces**

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| **Name of Probe** | **Source** | **Concepts addressed** |
| No probes available yet for this DCI at this grade level. Probes will be added to this section when new books come out. | | |

**PS3.D Energy in Chemical Processes and Everyday Life**

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| **Name of Probe** | **Source** | **Concepts addressed** |
| No probes available yet for this DCI at this grade level. Probes will be added to this section when new books come out. | | |

**PS4.A Wave Properties**

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| **Name of Probe** | **Source** | **Concepts addressed** |
| Do the Waves Move the Boat? | [*Uncovering Student Ideas in Primary Science*](https://www.uncoveringstudentideas.org/books/formative-assessment-probes/uncoveringstudentideas-primary) | Waves, wave motion |

**PS4.B Electromagnetic Radiation**

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| **Name of Probe** | **Source** | **Concepts addressed** |
| Can It Reflect Light? | [*Uncovering Student Ideas in Science- Vol. 1*](https://www.uncoveringstudentideas.org/books/formative-assessment-probes/uncoveringstudentideas-volume1) | light, reflection |
| Apple in the Dark | [*Uncovering Student Ideas in Science- Vol. 1*](https://www.uncoveringstudentideas.org/books/formative-assessment-probes/uncoveringstudentideas-volume1) | light, reflection, how we see objects |
| Birthday Candles | [*Uncovering Student Ideas in Science- Vol. 1*](https://www.uncoveringstudentideas.org/books/formative-assessment-probes/uncoveringstudentideas-volume1) | Light, how light travels |

**PS4.C Information Technologies and Instrumentation**

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| **Name of Probe** | **Source** | **Concepts addressed** |
| No probes available yet for this DCI at this grade level. Probes will be added to this section when new books come out. | | |

**ENGINEERING**

**ETS1.A Defining and Delimiting Engineering Problems**

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| **Name of Probe** | **Source** | **Concepts addressed** |
| What’s the Problem? | [*Uncovering Student Ideas About Engineering and Technology*](https://www.uncoveringstudentideas.org/books/formative-assessment-probes/uncoveringstudentideas-engineering-and-technology) | Defining a problem |
| Who Needs It? | [*Uncovering Student Ideas About Engineering and Technology*](https://www.uncoveringstudentideas.org/books/formative-assessment-probes/uncoveringstudentideas-engineering-and-technology) | Who to consider when defining and delimiting a problem |
| Pizza Problem | [*Uncovering Student Ideas About Engineering and Technology*](https://www.uncoveringstudentideas.org/books/formative-assessment-probes/uncoveringstudentideas-engineering-and-technology) | Researching a problem |
| Criteria and Constraints  (can be modified for gr. 4) | [*Uncovering Student Ideas About Engineering and Technology*](https://www.uncoveringstudentideas.org/books/formative-assessment-probes/uncoveringstudentideas-engineering-and-technology) | Criteria, constraints |

**ETS1.B Developing Possible Solutions**

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| **Name of Probe** | **Source** | **Concepts addressed** |
| An Engineering Design Process | [*Uncovering Student Ideas About Engineering and Technology*](https://www.uncoveringstudentideas.org/books/formative-assessment-probes/uncoveringstudentideas-engineering-and-technology) | Engineering Design Process (EDP) |
| How Do Engineers Solve Problems? | [*Uncovering Student Ideas About Engineering and Technology*](https://www.uncoveringstudentideas.org/books/formative-assessment-probes/uncoveringstudentideas-engineering-and-technology) | Engineering Design Process (EDP) |
| Brainstorming | [*Uncovering Student Ideas About Engineering and Technology*](https://www.uncoveringstudentideas.org/books/formative-assessment-probes/uncoveringstudentideas-engineering-and-technology) | Brainstorming process |
| Engineering and Nature | [*Uncovering Student Ideas About Engineering and Technology*](https://www.uncoveringstudentideas.org/books/formative-assessment-probes/uncoveringstudentideas-engineering-and-technology) | Biomimetics, using designs from nature |

**ETS1.C Optimizing the Design Solution**

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| **Name of Probe** | **Source** | **Concepts addressed** |
| Testing for Success | [*Uncovering Student Ideas About Engineering and Technology*](https://www.uncoveringstudentideas.org/books/formative-assessment-probes/uncoveringstudentideas-engineering-and-technology) | Testing solutions |

**CONNECTIONS TO ENGINEERING, TECHNOLOGY, AND APPLICATIONS OF SCIENCE**

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| **Name of Probe** | **Source** | **Concepts addressed** |
| What’s the Purpose of Technology? | [*Uncovering Student Ideas About Engineering and Technology*](https://www.uncoveringstudentideas.org/books/formative-assessment-probes/uncoveringstudentideas-engineering-and-technology) | why technologies are developed |
| Surrounded by Technologies | [*Uncovering Student Ideas About Engineering and Technology*](https://www.uncoveringstudentideas.org/books/formative-assessment-probes/uncoveringstudentideas-engineering-and-technology) | technology |
| Is It a Technology? | [*Uncovering Student Ideas About Engineering and Technology*](https://www.uncoveringstudentideas.org/books/formative-assessment-probes/uncoveringstudentideas-engineering-and-technology) | technology |
| How Do Technologies Change? | [*Uncovering Student Ideas About Engineering and Technology*](https://www.uncoveringstudentideas.org/books/formative-assessment-probes/uncoveringstudentideas-engineering-and-technology) | Technological advancement |