Harvard Undergraduate Science Olympiad 2026
Open Round
Earth Science Syllabus: 7th-8th Grade

Potential Topics Covered on the Exam:
Please note that not necessarily every topic on this list will be on the exam, don't get overwhelmed! The syllabus is meant to be exhaustive of all *potential* topics that could be on the exam (the ones in red represent harder topics that are less likely to appear on the exam). For students, a great place to start is with making sure you're comfortable with the ICSE curriculum for 7th-8th grade. It will be a difficult exam, but remember you don't need to (nor do we expect you) get a 100%! Just do your best and show us all that you've learned! Good luck and happy studying!

Atmosphere:

- Layers of atmosphere and composition

Fronts

- Air masses and fronts, pressure systems
- Cyclone formation

Humidity and precipitation:

- Relative humidity
- Water cycle
- Precipitation formation mechanism

Circulation

- Winds
- Circulation cells

Vertical structure of atmosphere
Specific phenomena:

- Cloud types and cloud formation

- Local winds
- Thunderstorms and other severe weather
- El Niño and La Niña
- Hurricanes

Hydrosphere:

Freshwater:

- Erosional and depositional features
- River valley processes

Oceans:

- Distribution of temperature and salinity
- Surface circulation
- Overturning circulation
- Waves and tides
- Tsunamis

Groundwater

- Aquifers
- Water table

Geosphere:

Geochemistry

- Minerals
    - Properties: crystal structure, hardness, opacity, fracture and cleavage, mineral habit, etc.
- 3 types of rocks and how they form

Interior

- Layers of the earth
- Earthquakes (types of waves)
- Plate movement and boundaries
- Faults
- Tectonic movement
- Soil Formation and Classification

Dating/Mapping

- Interpreting geologic maps
- Relative dating and unconformities

Astronomy:
Celestial Mechanics:

- Kepler's laws
- Gravitational force

Solar System:

- Earth-Moon system
- Structure and components of Solar System
- Eclipses

Preparation for Exam: The following resources may be helpful: ***Foundations of Earth Science by Tarbuck.*** The former is a great introduction to earth science for anyone who is interested! If you read this book carefully, you will have the necessary knowledge to complete most or even all of the questions.

Practice questions: Past open exams from **USESO** will be good practice, though they may be a little more difficult than the questions on the open round of HUSO Global. For astronomy, past problems from USAAAO are useful, yet also above the difficulty level of HUSO Global.

HUSO's Boston competition follows the rules of the US-based "Science Olympiad", which has competitors compete in teams in a variety of events. You may find Science Olympiad tests in the following events helpful: **Dynamic Planet** (freshwater, glaciers, oceanography, tectonics), **Rocks and Minerals,** and **Geologic Mapping.** Tests should be easily findable online.