1. What is our purpose?
To inquire into the following:
  • transdisciplinary theme
How the World Works (An inquiry into the natural world and its laws...)
  • central idea
Our solar system is made up of many different space bodies held together by gravity.

Summative assessment task(s):
What are the possible ways of assessing students’ understanding of the central idea? What evidence, including student-initiated actions, will we look for?

Book (summative assessment for report writing component of this unit) – evidence of different features of non-fiction text, citing sources (students do research, find pictures to match text, write text; teacher publishes), students can put what they have found in their own words (no plagiarism)
Explanation/physical way to show how gravity works – evidence of the student identify gravity and describing movement, ability to explain what happens in “laymen’s terms”, creativity in creating their demonstration.

IST Benchmarks:
  • identify simple forces (including gravity) that cause movement.
  • describe the characteristics and movement of objects in our solar system.
  • identify and describe obvious features of the earth and sky.

2. What do we want to learn?
What are the key concepts (form, function, causation, change, connection, perspective, responsibility, reflection) to be emphasized within this inquiry?
Form, function
What lines of inquiry will define the scope of the inquiry into the central idea?
  • the unique characteristics of the planets in our solar system
  • how gravity makes the solar system work
  • how the sun affects the earth and the moon
  • how the earth and the moon affect each other

What teacher questions/provocations will drive these inquiries?
Need to look into new development or celestial events...
Is Pluto a planet? Very thought provoking and motivating question, especially because Pluto was just downgraded to a dwarf planet.
Visit to the Beijing Planetarium.
3. How might we know what we have learned?

This column should be used in conjunction with “How best might we learn?”

**Tuning In**

What are the possible ways of assessing students’ prior knowledge and skills? What evidence will we look for?

- Students brainstorm questions they have and bundle questions.
  - Sort questions into open/closed questions
  - Use questions to prepare More True than False statements
- Students explain how the solar system works. Can choose to explain verbally with or without props and diagrams. Mpg the explanation.

What are the possible ways of assessing student learning in the context of the lines of inquiry? What evidence will we look for?

Students draw pictures of the solar system without referring to anything. Evidence of understanding includes order of the planets, relative size including sun, and distance.

4. How best might we learn?

What are the learning experiences suggested by the teacher and/or students to encourage the students to engage with the inquiries and address the driving questions?

**Finding Out:**

- Answer closed questions from the Tuning In
- Google image search and post it connections TT, TS, TW
- Experiments – Students look for experiments in videos and books

**Sorting Out/Making Conclusions:**

“I Thought, Now I Think”

**Going Further** – repeat inquiry cycle project (form, function)

What opportunities will occur for transdisciplinary skills development and for the development of the attributes of the learner profile?

**Research skills** – formulating questions, gathering information from images, videos, and text using keywords, writing statements from said keywords

**Knowledgeable** – Students will show their knowledge of the planets in the solar system by writing a book on a planet of their choice. They will also be knowledgeable about using the inquiry cycle to research into a given topic and the stages of the writing process.

**Inquirer** – Students will demonstrate the behaviors of the inquirer by generating questions and being persistent in the search for answers through research in print and online sources.

5. What resources need to be gathered?

What people, places, audio-visual materials, related literature, music, art, computer software, etc, will be available?

Magic School Bus videos (moon and planets – Jo to do videostreaming)

- [www.EarthSky.org](http://www.EarthSky.org) – has a link where you can ask a scientist about different topics.
- [www.nasa.gov](http://www.nasa.gov) – was a good resource for images and videos, but required some teacher assistance
- [www.hubblesite.org](http://www.hubblesite.org) – was another good resource for images of space

How will the classroom environment, local environment, and/or the community be used to facilitate the inquiry?

Beijing Planetarium (this is in downtown Beijing, so book with plenty of advance)
6. To what extent did we achieve our purpose?
Assess the outcome of the inquiry by providing evidence of students’ understanding of the central idea. The reflections of all teachers involved in the planning and teaching of the inquiry should be included.

Both classes went on different paths. One was more interested in the first part of the central idea, general space knowledge, and the other focused more on the gravity part.

How you could improve on the assessment task(s) so that you would have a more accurate picture of each student’s understanding of the central idea.

The assessment task is good as long as the students have a question that can be answered with the resources available to them. Students need to be steered away from traditional forms of presentations such as posters and PowerPoint slideshows. Instead, teachers should guide towards experiments, demonstrations, or skits to show their understanding.

What was the evidence that connections were made between the central idea and the transdisciplinary theme?

The gravity focus fits better with the transdisciplinary them than the knowledge of the solar system does. Gravity directly links to the first part of the theme which states … the natural world and its laws. One of the questions we kept asking was “How does the solar system work?” paralleling the theme “How does the world work”.

7. To what extent did we include the elements of the PYP?
What were the learning experiences that enabled students to:

• develop an understanding of the concepts identified in “What do we want to learn?”

form – students studied the planets in depth

function – how does the solar system work? How does gravity work?

connection - this concept came through naturally as we looked at how the space bodies affect each other. The solar system wouldn’t work without all its parts.

• demonstrate the learning and application of particular transdisciplinary skills?

Lots of research led to practice with note-taking, using keywords to summarize, paraphrase and search on the internet, formulating questions for research, using a planner to guide their research/inquiry cycle

It was also good for learning about different types of resources: books, encyclopedias, internet, experts.

Research of this sort requires lots of materials at their reading/listening level.

• develop particular attributes of the learner profile and/or attitudes?

Knowledgeable – students did gain a lot of information about the solar system and its workings.

Inquirer – It was obvious whether they acted like inquirers or not in the amount of knowledge that they gained.

Thinker – This came through more in the final projects. One of the final assessment checklist items referred directly to this and their independent problem solving.
Reflecting on the inquiry

8. What student-initiated inquiries arose from the learning?
Record a range of student-initiated inquiries and student questions and highlight any that were incorporated into the teaching and learning.

At this point teachers should go back to box 2 “What do we want to learn?” and highlight the teacher questions/provocations that were most effective in driving the inquiries.

What student-initiated actions arose from the learning?
Record student-initiated actions taken by individuals or groups showing their ability to reflect, to choose and to act.

- One student made a book on the weekend about the solar system.
- Many students brought in books about the solar system.
- Some students report that they will go to the planetarium with their families.
- Lots of the students reported visiting the websites we used in class. Many of them researched in their home language and in their own time, and brought their notes to school.
- Play during recess had astronaut and planet themes.

9. Teacher notes

Key Words:
- Orbit
- Rotate
- Atmosphere
- Asteroid
- Axis
- Planet
- Gas
- Gravity
- Oxygen
- Moon
- Sun
- Star
- Spacecraft
- Tides – can be removed
- Eclipse – can be removed
- Waxing (phases of the moon) – can be removed
- Waning (phases of the moon) – can be removed
- Astronaut
- System (as in solar system)
- Probe (as in space probe)
- mass

Words highlighted in yellow were sent home as a translation activity.

It might be helpful to do a mini-unit on the three states of matter and the concept of mass, perhaps as a frontloading. Our curriculum has it for grade 3, but it could be switched with Grade 1’s benchmarks on magnetism.

There are too many lines of inquiry. They can be reduced to the first two as they are broad enough to lead into different paths.

The unit's timing as the fourth unit was good, as by now they have consolidated reading and writing skills for their research.