Team Teaching

The purpose of this assignment is to give you an opportunity to work with another teacher, share with them, and work through an academic unit together. Hopefully you will find that two minds are better than one. Your task will be to determine how and why two minds are better than one.

You should find a teacher in your school who you would like to partner with to plan together a two week unit. Ideally you will be teaching the same thing on the same day for two weeks. You should first have a plan for the two weeks that both of you like. Then each day of the 2 weeks you should get together to discuss what went well, what could have been improved, what needs to be reviewed, and what you intend to do the next day.

You should include in this assignment:
- A two-week lesson plan.
- 10 days of reflection and planning.
- And a 2-3 page reflection on your impressions of what went well and what could have been improved

Use the pages that follow for each part of the assignment.
Two-Week Lesson Plan

Subject: 8th Grade Physical Science
Topic: The Solar System/Stars, Galaxies, and the Universe
Teachers: S.Kim and Y.Ghim

Lesson 1: Observing the Solar System

Purpose: Identify the geocentric and heliocentric systems. Recognize how scientists such as Copernicus, Galileo, and Kepler contributed to acceptance of the heliocentric system. Identify the objects that make up the solar system.

Introduction: Bring a photograph of the night sky and ask the students to identify the objects.

Activities: Read pp.538-544 and lecture/notes

Review: Math Analyzing Data p.542 #1-4, Review Questions p.544 #1-3

Homework: Workbook 14.1

Teaching Methods? visual aides, direct instruction, and independent practice

Lesson 2: The Sun

Purpose: Explain how the sun produces energy. Name the three layers of the sun's interior. Identify the three layers of the sun’s atmosphere. Describe features that form on or above the sun’s surface.

Introduction: Have students describe what sunburn feels like and then discuss that the sun gives off light and heat.

Activities: Read pp.546-550 and lecture/notes

Review: Draw, color, and label the layers of the sun.

Homework: Review Questions p.550 #1-3

Teaching Methods? class discussion, direct instruction, visual/kinesthetic, and independent practice

Lesson 3: The Inner Planets

Purpose: Describe the characteristics that the inner planets have in common. Identify the main characteristics that distinguish each of the inner planets.
Introduction: p.552 Standards Warm-Up (How Does Mars Look From Earth?)

Activities: Read pp.552-559, Jigsaw

Review: Travel Brochure—Select one of the inner planets other than Earth. Design a travel brochure for your selected planet, including basic facts and descriptions of places of interest. Also include a few sketches or photos to go along with your text.

Homework: Review Questions p.559 #1-2

Teaching Methods? hands-on activity, cooperative learning, and creative writing

Lesson 4: The Outer Planets

Purpose: Describe characteristics that the gas giants have in common. Identify characteristics that distinguish each outer planet.

Introduction: p.562 Standards Warm-Up (How Big Are the Planets?)

Activities: Read pp.562-569, Jigsaw

Review: Draw and labels the planets in the solar system.

Homework: Review Questions p.569 #1-2

Teaching Methods? Compare and contrast, reading, cooperative learning, and visual/kinesthetic

Lesson 5: Comets, Asteroids, and Meteors

Purpose: Describe the characteristics of comets. Identify where most asteroids are found. Explain what meteoroids are and how they form.

Introduction: p.572 Standards Warm-Up (Which Way Do Comet Tails Point?)

Activities: Read pp.572-575, lecture/notes

Review: Review Questions p.575 #1-3

Homework: Workbook 14.5

Teaching Methods? hands-on activity, direct instruction, and independent practice

Lesson 6: Is There Life Beyond Earth?
Lesson 7: Characteristics of Stars

Purpose: Explain how stars are classified. Describe how astronomers measure distances to the stars. Describe the H-R diagram, and explain how astronomers use it.

Introduction: p.598 Standards Warm-Up (How Does your Thumb Move?)

Activities: Read pp.598-605

Review: color and label the H-R diagram

Homework: Review Questions p.605 #1-3

Teaching Methods? hands-on activity, reading, visual/kinesthetic, and independent practice

Lesson 8: Lives of Stars

Purpose: Explain how a star forms. Identify what determines how long a star will live. Describe what happens to a star when it runs out of fuel.

Introduction: p.608 Standards Warm0Up (What Determines How Long Stars Live?)

Activities: Read pp.608-613, lecture/notes

Review: Draw and labels the life cycle of stars

Homework: Review Questions p.613 #1-3

Teaching Methods? data analysis, reading, note taking, visual/kinesthetic

Lesson 9: Star Systems and Galaxies
Purpose: Define a star system. Identify the major types of galaxies. Explain how astronomers describe the scale of the universe.

Introduction: p.614 Standards Warm-Up (Why Does the Milky Way Look Hazy?)

Activities: Read pp.614-621, lecture/notes

Review: p.619 Spiral Galaxy model

Homework: Review Questions p.621 #1-3

Teaching Methods? visual/kinesthetic, reading, note taking, hands-on

Lesson 10: The Expanding Universe

Purpose: State the big bang theory. Explain how the solar system formed. Describe what astronomers predict about the future of the universe.

Introduction: p.622 Standards Warm-Up (How Does the Universe Expand?)

Activities: Read pp.622-627, lecture/notes

Review: Draw and labels the formation of the solar system

Homework: Review Questions p.627 #1-3

Teaching Methods: reading, note taking, visual/kinesthetic
Team Teaching Assignment

Reflection Day 1

What went well?

Students seemed very interested in the solar system. They enjoyed looking at the stars and the moon. Reading through the history, students were able to relate more to the stories than to the theories. They seemed very excited about the unit.

What could have been done better?

I wish I had brought in models of the solar system, so the students could actually see the difference between the geocentric and the heliocentric systems. The two-dimensional figures in the text did not do justice. Lectures were dull. Students struggled a bit with analyzing the data. They need more practice looking at graphs and charts.

What will you do tomorrow?

I will see if I could bring in a video or more vibrant color pictures of the solar system. I think I need more than what is in the text. And, I should look up labs and other hands-on activities for this unit. I think my lessons need to be more interactive and student-centered.

Educational concepts used or observed.

To help students grasp the scientific concepts, I need to develop their contextual knowledge. The historical background gave them something to relate to. Assessing the prior knowledge helps the teacher to identify any misconceptions. Students already seemed to know a lot about the solar system, and I need to find out what they are missing or misunderstanding, so I can address their needs.

Reflection Day 2

What went well?

Students enjoyed drawing and coloring the layers of the sun. They realized that the sun was not made of just a single part, but of multiple layers. The pictures in the book were much better in this section.

What could have been done better?

They seemed to have forgotten about the elements and the chemical reactions. I am not sure if they understood the processes of the nuclear fusion. They seemed to have trouble differentiating between the solar flare and the prominence. Coloring took a lot longer than I had expected for some students.
What will you do tomorrow?

I will have those students who are not already done with the coloring to start labeling and finish coloring for homework. I will reinforce the different features of the sun and make sure the students know what sunspots, prominences, solar flares, and solar winds are.

Educational concepts used or observed.

Although the students have already learned about the elements and the chemical reactions, it has been a while since we studied the unit, so a lot of them have forgotten. Reteaching the essential prior knowledge concepts is necessary before teaching new concepts. I realized that teaching once is not enough. Students need to review.

Reflection Day 3

What went well?

Students enjoyed working in groups. In groups of four or five, each student read about one of the inner planets, and shared his/her notes with the rest of the group. This alleviated the load for each student and gave students more responsibility as the group depended on each other. Social interactions motivated the students.

What could have been done better?

I think the Jigsaw activity went well. If anything, I wish I had combined the inner planets with the outer planets. I think there would have been enough time to do all the planets in the solar system. Oh, I forgot about the solar system coloring packet I had from last year. I should have passed it out today, so they can color as they wrote down the facts for each planet.

What will you do tomorrow?

I will make copies of the solar system coloring packet, so the students can write down the facts right on the packet. I think I will also have the students come up with review game questions. If there is enough time tomorrow, I can play the review game. If not, I can save it for the end of the chapter review session.

Educational concepts used or observed.

Cooperative learning gives students the opportunity to connect with their peers socially and to support each other academically. They can explain the concept to each other in words they can understand. Explaining to other students, the students can exercise higher-order thinking. Working with peers is less threatening for the struggling students and more engaging for all.
Reflection Day 4

What went well?

Today was a lot similar to yesterday. Students enjoyed the interactions with their peers. Since they had already done the Jigsaw activity the day before, they knew what to do, and they were able to start right away.

What could have been done better?

Grouping of the students was random. Next time, I should group the students more intentionally, i.e. according to their ability. I need to make sure each group has a mix of high and low students. Time management and pacing need work.

What will you do tomorrow?

I will have the students compare and contrast the inner and the outer planets to reinforce the key characteristics of each. There is a Bill Nye video on the solar system, so maybe I’ll show the video at the end of the week.

Educational concepts used or observed.

Cooperative learning is more effective when thoughtfully structured. Set clear expectations to yield desirable results. Set time limit for more efficiency.

Reflection Day 5

What went well?

Students enjoyed the hands-on standards warm-up activity. Through the model, they were able to visualize the different parts of a comet. They asked a lot of good questions about asteroids and meteors and their impact on earth, and they were very interested in the celestial objects.

What could have been done better?

If I were able to bring in real samples of meteorites, it would have been far more interesting for the students. They struggled to understand the difference between comets, asteroids, and meteors. The book defined all three as chunks of “rock” and “dust”, and it was a bit confusing for the students.

What will you do tomorrow?

I’ll ask the students to compare and contrast between the asteroids and the meteors. I’ll try to bring some pictures or look up high-resolution images online.
Educational concepts used or observed.

Scientific vocabulary words are often abstract and foreign for students to understand. They need to learn the words in context and learn to define the words in their own words. Rather than having the students copy down the definition from the glossary, I should ask them to use the words in sentences.

Reflection Day 6

What went well?

Students showed a lot of interests in the possibility of life beyond earth. They were surprised to read about Mars and Europa showing signs of life. A lot of them thought we should invest more time and money on space exploration. When asked who would like to become space tourists or astronauts, several of them raised their hands. The discussion prompted responses from everyone. Their comments helped me to see where they were coming from.

What could have been done better?

During class discussions, the same few students repeatedly volunteered, but I wanted to make sure everyone was equally engaged. I need to think of ways to facilitate more active participation from everyone. A lot of interesting questions distracted the theme of the discussion. I think it was good, but I should have saved the questions until later.

What will you do tomorrow?

Review the planets in the solar system and the sun and start the next chapter on stars and galaxies. Guide students to make connections between the sun, the gas giants, and the stars.

Educational concepts used or observed.

Students were able to make connections between science and society by reading and discussing about space exploration. They became aware of the challenges of setting the budget, planning the program, and executing the mission. Along the way, they confronted their misconceptions and myths from science fiction books and movies. Analysis required the use of higher-order thinking skills.

Reflection Day 7

What went well?

Students enjoyed the coloring and seeing that each color represented a different surface temperature. In general, they were interested in stars. There were a lot of questions about
the sun and the impact of its eventual death. Learning about other stars in the galaxy fascinated them, and it seemed to have broadened their perspectives.

What could have been done better?

Students struggled with the concept of parallax. I was not sure how to demonstrate the parallax of stars and how helpful it is in astronomy. Also, the concept of brightness was hard to grasp. All stars are bright. To convince the students that there are different levels of brightness was a challenge.

What will you do tomorrow?

Using the H-R diagram the students colored and labeled today, I will continue onto the next section on the life cycle of stars. And, there is a short DVD clip on the black hole. I think it can answer a lot of their questions.

Educational concepts used or observed.

Students first learned about the sun before learning about the characteristics of stars in general. Building upon their prior knowledge about the sun, they were able to make connections. Since they have all experienced looking at the stars at night, they were able to relate to the lesson.

Reflection Day 8

What went well?

The analogy between people at different stages in life and stars at different stages in the life cycle helped the students to better understand the concept. The flow chart showing the lives of stars helped the students to predict what would eventually happen to the sun.

What could have been done better?

I need better images for the stars. Actually, I don’t know what red giants, super giants, white dwarfs, and neutron stars really look like. It’s really hard to tell the difference, if any, from the textbook pictures. There were endless questions about the black hole, and I felt like I did not know enough about it to answer all their questions. I need to do more research.

What will you do tomorrow?

I will reinforce the characteristics and the lifetimes of stars and go onto the next section, star systems and galaxies.

Educational concepts used or observed.
Through question and answer, the teacher can identify the students’ needs and students can choose the topics they are more interested in discussing. Active student participation in the lesson motivates students. However, guidelines are needed to make sure the students stay on task and the discussion is productive.

Reflection Day 9

What went well?

Students were very interested in learning more about the Milky Way galaxy. Looking at the solar system only as a small part of the galaxy opened their eyes and led to discussions about what is out there. They had remembered what solar and lunar eclipses were and made connections to the eclipsing binaries.

What could have been done better?

I am not sure how to demonstrate the scale of the universe. The numbers are so big, and the concept of a light year is far beyond the scope of the students’ understanding. The scientific notation turned out to be a mini math lesson.

What will you do tomorrow?

Review the different types of galaxies and continue onto the formation of the universe.

Educational concepts used or observed.

Lack of experience could limit students’ ability to understand a particular concept. Some students were not familiar with the scientific notation, so the scale did not make much sense to them. Before presenting the new material, they first needed the background knowledge. What students bring into the classroom affects what and how they learn.

Reflection Day 10

What went well?

The big bang theory generated a lot of questions and led to discussions about beliefs and science. All students were engaged in the lesson, and their questions helped clarify misunderstandings.

What could have been done better?

Before presenting the big bang theory, I could have asked the students how the universe might have started and come up with the sequence for the stars, the planets, and the other celestial bodies. Instead of going into an impromptu Q & A session, the questions could have been written out, so I could have prepared the answers in advance.
What will you do tomorrow?

Review the last two chapters. Do a review game. Reinforce the concepts on the solar system, the sun, the stars, and the galaxies. Prepare for an upcoming test. Check for student understanding.

Educational concepts used or observed.

Instead of simply feeding them the answers, ask questions to facilitate the discussion. Students need the opportunity to develop their own thinking skills. As they learn to ask questions, they will become aware of what they know and do not know. Through discovery, they will remember what they learn and retain it longer.
Team Teaching Reflection
Suggested reflections:
- Reflections on Working with others
- Reflections on pedagogy
- Reflections on psychology
- Reflections on teaching in general.
- Reflections on science teaching

Working with Mrs. Ghim, I realized that our students shared a lot in common. Sharing each other’s successes and failures, I spared myself from reinventing the wheel. Especially since she has had more years of teaching experience, her insight was helpful. Planning the lessons with another teacher brought in a fresh perspective and stretched me beyond my comfort zone. Although meeting each other at the end of the day took time away from grading or copying, I think it was worthwhile. Mrs. Ghim’s strong background in chemistry clarified the difficult concepts students struggled with. I appreciated the opportunity to take advantage of both of our strengths and complement our weaknesses.

As we were planning our lessons together, I realized that while our teaching styles were similar, there were still a few adjustments to make. At first, I was not sure how the change would work for me and for my students, but I think it worked out at the end. Mrs. Ghim has taught high school in the past, so her approach was a bit more theoretical than mine. She was still able to deliver the idea across, and her students seemed to have understood. Bringing the rigor and the support, students received quality instruction. I learned that given high expectations and strong support, the students came through.

In regards to the pedagogy, I felt limited, and I was not sure what else I could do. During the last four years of my teaching career, I have become so used to lecturing and note taking, I have not invested much in other strategies. I try to incorporate labs and activities as much as I can, but it is hard for me to come up with creative lessons on my
own. Working with another teacher, I was able to get some ideas I would not have thought of on my own. I did not receive any science content-specific training in my credential program, and I am glad that I am learning a lot in my master’s program now. To be honest, team teaching rarely happens. Unless the two teachers carve out time and commit to collaboration, it usually turns out to be inefficient and unproductive. Having the structure, the two-week team teaching was helpful for both of us and our students.

A lot of times, teaching is an isolated, independent practice. Last time I walked into another teacher’s classroom was during my student teaching. Now that I have my own classroom and my own set of students, I do not get to go visit other teachers and observe what goes on in their classrooms. Working together with another teacher, I got a glimpse of what her students go through and I learned a lot. I wish I could collaborate more often. There are rich resources amongst the staff, but teachers often do not take advantage of each other’s skill. In the upcoming school year, I would like the grade-level department teachers to collaborate more to make sure all the 8th graders are getting the same content at the same level of rigor.

Teaching science has its limitations, especially if there are not enough resources for labs and demonstrations. In particular, teaching the unit on astronomy was challenging since I could not show them the sun, the stars, or the planets. I replied heavily on the text and the Bill Nye the Science Guy. As technology advances, I hope there are more affordable multimedia resources available for the classroom. I know there are a lot of resources out there, but the prices are not within my budget.

During the last two weeks, I learned to stop and think after each day’s lesson. Reflection helped me to see what went well and what needed work. Having another
teacher to plan the lessons and to discuss the results, I became more confident in my teaching. Students benefited from both of our experiences and expertise. A lot more can be achieved through collaboration than either of us could on our own. We have our students’ best interests in mind, and collaboration is another way to bring student success and colleague accountability. I hope I can remember what I have learned for next year and continue to grow as an educator.