Date: 20.12.12
Teacher: Pelin Konuk
Number of Students: 20
Grade Level: 6th Graders
Time Frame: 45 min.

Mathematics Learning Plan

1. Goal(s)
- To develop an understanding of number patterns, adding positive natural numbers by doing an activity.

2A. Specific Objectives (measurable)
- Students should be able to add positive integers
- Students should be able to write the numbers that they are hearing from the Christmas song and do operations on these numbers.

2B. Ministry of National Education (MoNE) Objectives
- Doğal sayılar kümesinde toplama işlemi yapar ve özelliklerini uygular.

2C. NCTM-CCSS-IB or IGCSE Standards:
- Count with understanding and recognize "how many" in sets of objects.

3. Rationale
- The purpose of this lesson is doing basic operations on numbers by having fun. Students will listen to music about Christmas (The twelve days of Christmas) and they will try to answer the questions related with the numbers which is told in the song.
- This lesson is about adding natural numbers and trying to discover the pattern between them. We can link this lesson with real life easily because in real life we use so adding operation commonly. For example, if you do a shopping you can find "how much money will you pay?" by doing adding operation.
- We can also link this lesson with STEM education because, as STEM education promotes discovery, problem based learning and project based learning: students in this lesson will try to discover number patterns in groups by listening music.

4. Materials
- Computer
- Projector

5. Resources
- Teaching Secondary and Middle School Mathematics. Daniel J. Brahier.
- Twelve days of Christmas song: http://www.youtube.com/watch?v=EDBMzGq1vhs .

6. Getting Ready for the Lesson (Preparation Information)
- In order to carry out the activity, you should decide how will you going to give the instructions. Because in this activity you can ask many questions to students. What you want your students to do adding natural numbers for each day or at the end twelve days? Do you want students to find a pattern or find the total cost of gifts?
- You should check the internet connection in the classroom in order to find the song (see resources). If you do not have the connection, you can download the song earlier.
- You do not have to do any special sitting plan for the activity.
- Students will work two students in one group. (You should arrange them who sits next to each other)
- Virtual manipulative will not be used during lesson.

7. Prior Background Knowledge (Prerequisite Skills)
- Students should know how to add natural numbers before this lesson. They also should know adding more than two numbers.
- Students should successfully accomplished accessing and analyzing information and also critical thinking ability before this activity. Because in this activity, first they should write what they heard from the song and then by analyzing information they should try to find a pattern.

Lesson Procedures

Transition: Hello again! Today we are going to do an enjoyable activity that I think all of you will like it. We will listen to song and then try to do some mathematics on it. Do not you think it is interesting?

A. Engage (5-7 min.)
- Say students that the song they are going to listen called "twelve days of Christmas". Ask if they any plans for Christmas holiday.

- Ask if students know anything about Gauss or not. Tell them today they will try to find very important pattern that Gauss discovered years ago.

Transition: Now, I will try to explain what are you going to do while listening this famous Christmas song.

C. Explain (15 min.)
- Tell students that first listen to the song and make the notes for each day how many gifts did are singer get. Want them to write down for each day.
- After writing the data, have students to review the words to the song. Then want students to determine how many gifts a person receives on each day.
- After checking their answers, want students to find how many gifts a person receives at the end of the twelve days.

Transition: In order to do extend the activity. Ask students a challenging question: Now I want you to try to find the pattern between the numbers.

D. Extend (10 min.)
- To do the extention part, ask students to find the pattern between the numbers. (It is not very easy to find so give some clues when necessary).
- If some students can find the pattern easily ask them to find the cost of the total gifts. (You should give the cost for each gift first).

Transition: Give some clues on the board in order to enable students to find the pattern easier.

B. Explore (10 min.)
- At the end of the activity, by working in the groups, students will try to explore the pattern.
- While students are trying to find the pattern, teacher should observe them and if it is necessary the teacher should give some clues.

E. Evaluate (5)
- While students are working in the group, walk in the classroom and observe them.
- If they need any help, go and try to help them.

- Focus on group work. If students trying to work together or individually?
- Use the following rubric:

Unacceptable	Needs improving	Excellent
Students do not work on the question.	Students working on the question but individually.	Students are working as a group on the question and try to find the solution.
Students are working as a group but they could not find any of the solutions.	Students are working as a group and some of the solutions are correct.	Students are working as a group and do all of the questions correctly.
The group does not present solutions for question.	There are some lacks of presenting solutions.	The group presents solutions clearly. Connections and comparisons are stated appropriately.

9. Closure & Relevance for Future Learning
- Ask students if they could find the pattern or not.
- Tell students that it is a very good pattern that they can use commonly in order to solve the questions. Encourage students to keep going to study at their homes.

- Say students "have a good holiday" that they will have a Christmas Holiday soon.

10. Specific Key Questions:
- What is a number pattern really means? (Bloom's Taxonomy Comprehension Stage, Polya's 4 stages: Understanding the problem)
- While trying to solve questions with students you may ask from where we should start? (Bloom's Taxonomy Knowledge Stage)
- Do not give the pattern directly. Try students to find out the pattern. What am I going to do next? (Bloom's Taxonomy Knowledge Stage)
- Where am I going to use addition in real life? (Bloom's Taxonomy Synthesis Stage)
- Why are we doing this activity? (Bloom's Taxonomy Analysis Stage)
- Explain your reasoning (Bloom's Taxonomy Evaluation Stage)

11. Modifications
- First, you should ask two specific questions to all students. You can find them to find how many gifts will a person has for each day and how many gifts a person has at the end of the twelve days.
- You should modify your lesson by giving some more challenging questions like now try to find the pattern between the numbers by making a table.

Reflective Evaluation of the Lesson

While preparing this lesson plan, I have learned so many things again. I made a very deep research about how can I integrate mathematics and Christmas. Making this research made a great contribution to my knowledge about how different activities a teacher can do in the classroom. I have learned a very popular Christmas song: Twelve days of Christmas that I have no idea before. I have also learned how I can encourage students to do mathematics by doing activities in the classroom. I hope it will be a great lesson tomorrow. Both students and I will have lots of fun at the same time learn new things.