Math Topic: Number Theory
(Multiples, Factors, Primes and Composite Numbers)

Grade Level(s): 5/6

Learning Outcomes:

Grade 5

A3 Apply mental mathematics strategies and number properties, such as:

(a) skip counting from a known fact **(b)** using doubling or halving

(c) using patterns in the 9s facts **(d)** using repeated doubling or halving

to determine *(RECALL)* answers for basic multiplication facts to 81and related division facts.

A4 Apply mental mathematics strategies for multiplication, such as:

(b) halving & doubling

Grade 6

A3 Demonstrate an understanding of factors and multiples (concretely, pictorially and symbolically) by:

(a) determining multiples and factors of numbers less than 100

(b) identifying prime and composite numbers solving problems involving multiples.

Context of Lesson within the unit:

The students had already taught and had specific practice on the above learning outcomes. This lesson was used to reinforce the skills and provide practice.

Materials/Set Up:

- Chain links Game
- Students arranged in same grade small groups of three or four students

Lesson Ideas:

1. Share Learning Intention: By the end of the hour, you will have helped to create and use criteria to show that you are successful at a game called Chain Links. You will also become more efficient at working with Factors, Multiples and for the Grade 6's primes and composites.

2. Warm-up or review of concepts: First independently, then in small groups, right your own definition for the following:

Grade 5	Grade 6
Multiples	Factors
Doubles or halves	Multiples
Product	Prime Numbers
Related division facts	Composite Numbers

   Report out and note student definitions.

3. Activity with many levels of entry introduced and practiced
   Introduce the Chain Links game (see handout). Demonstrate for the class first, noting how the numbers are being linked from one to the other. Have students play individually for aprox. 5 minutes. Then debrief with a partner the strategies they used, then with the class. If the 'rules' of the game are unclear, play again otherwise move to the criteria setting.

4. Establish Criteria for success

   You will know you fully understand the concepts when you:

   First in groups have the students brainstorm how they would be able to know if a student fully understands the concepts listed in #2 and can use them in the game.

   Share out the ideas and summarize for the class.

   (Note: Students from a 5/6 class we worked with came up with the following …
   - Only 10 numbers left over
   - A variety of different links were used to play the game (list them)
   - At least 5 multiples/factors were used to link the numbers

   The students must create their own criteria – this is provided just to give you an idea of what they may come up with.)

5. Activity continued:
   Play the game again. Have students self assess and report to a peer how they did. Repeat the game trying to improve their results.

6. Reflection: Self assessment based on criteria and learning intention.
   Students complete the "I want you to notice" section. Provide them with prompts for this and refer them back to the criteria.

7. Ticket out the door: Question that links to the learning intention
   Are you strongest at finding a factor or a multiple (gr. 6 prime or composite)? Give an example.

Lesson Review:

- Did I connect the concept to previous experiences?
  - ✓ Yes – had to provide definitions from previous lessons
- Did I provide individual choice?
  - ❖ No – all played the same game
- Was there an open-ended task?
  - ✓ Yes – Chain link game
- Was it possible to enter the task from a variety of levels?
  - ✓ Yes – game could be played with simple multiples (2's, 5's and 10's) and at the other extreme an unlimited variety of links encouraged.
- Was time provided for 'Turn and Talk' for sharing of strategies and perspectives?
  - ✓ Yes – in the warm up, debrief of game strategies and criteria development.