Power Practice Printable Part 2 Junior High School, Grade 2 Mathematics 2

[Number and Formula] (dialogues)

Characters

Child A (Hiroki) ... The main character

Child B (Takeshi) ... Hiroki's classmate

Child C (Kiyoshi) ... Hiroki's classmate.

(1) Opening

Presentation of the title

Power Play Print Part 2: Junior High School 2nd Grade Mathematics 2

Numbers and formula

H21 National Survey A Problem

(2) A scenario in which we inductively find the rule that when three numbers in a calendar are added together, they become a multiple of three.

A: Listen to me. When I woke up in the morning and looked at the calendar, I discovered this.

B: What is it?

A: When I added up the three numbers in a row, I realized that there was a law.

(Take out the calendar.)

7+8+9= 24

8+9+10= 27

A: Put a "0" on the date.

20+21+22= 63

21+22+23=66

Is there anything that you notice?

Narrator: What kind of laws are there? (Thinking Time)

B: They're all multiples of 3... aren't they?

C: Isn't this true that it is not only for calendars, but also for the sum of all three consecutive natural numbers?

(3) A situation in which you consider how to find out that the sum of three consecutive natural numbers is a multiple of three.

1+2+3=6

2+3+4=9

3+4+5=12

...

B: I mean, won't it take forever to get it right?

C: Isn't it possible to do it all at once?

Narrator: I want to show that for any number, the sum of three consecutive natural numbers is a multiple of three. Going through all the various numbers is not going to end anytime soon. How can we show that this is always possible?

(4) Thinking about how to represent three consecutive natural numbers.

A: Why don't you use the letters you learned in first grade to show them?

So, if the smallest number is n, how can we represent the three consecutive natural numbers? But I don't know what to do....

B: "Hiroki, I've got a glimmer of inspiration!

Why don't you write down some three consecutive numbers, think about what kind of relationship there is between the three numbers, and then try to figure out how to represent the three numbers using letters?

2、3、4

3、4、5

4、5、6

...

10、11、12

I've just made four rows which includes three natural numbers each.

Comparing them, what do they have in common?

Narrator: Let's think about what they have in common.

A: It's increased by 1 from left to centre.

Even from the middle to the right, it increases by one.

From the leftmost to the rightmost, there is an increase of 2.

A: Using the rules we just found, let's represent three consecutive natural numbers using letters! First of all, if the smallest natural number is n, how can the other two natural numbers be represented?

B: At first... the leftmost natural number is n, 0, 0 right? The second natural number from the left is one greater than the leftmost one, as we just saw, so it becomes ···· n, n+1, 0.

The third natural number is one greater than the middle, so...

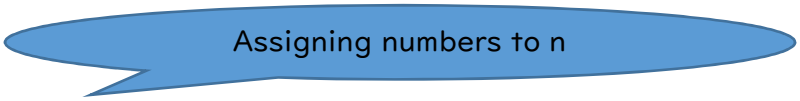
n, n+1, (n+1)+1

n, n+1, n+2, right?

(5) Checking the meaning of represented formula.

A: Now you can represent three consecutive natural numbers using letters right?

B: If we apply the numbers to n, the next number is n plus one, and the rightmost number is n plus two.



When n=1, n, n+1, and n+2 = 1, 2, and 3 The sum is 6

When n=2, n, n+1, and n+2 = 2, 3, and 4 The sum is 9

When n=3, n, n+1, and n+2 = 3, 4, and 5 The sum is 12

When n = 4, n, n+1, and n+2 = 4, 5, and 6 The sum is 15

...

When n = 10, n and n+1 and n+2 are 10 and 11 and 12, and the sum is 33, which is definitely a multiple of 3!

(6) A situation in which you use a letter expression to deduct and verify that the number is always a multiple of three.

A: The sum of three consecutive natural numbers is n+(n+1)+(n+2)=n+n+1+n+2 If you calculate...

=3n+3

B: But how do I show that it's a multiple of three?

Narrator: How do we transform 3n+3 to say it is a multiple of 3?

C: Multiples of 3 are 3, 6, 9, 12, 15, 18, ・・・・…

This is 3×1, 3×2, 3×3, 3×4, 3×5, 3×6・・・・

If I wanted to say "multiple of 3", I could just say 3 multiplied by a natural number, right?

A: So if you can make a 3x□ shape, you can say it's a multiple of 3, right?

To make 3n+3 into a 3x□ shape ⇒ [* continued] Put 3 in front of... 3n+3=3(n+1)!

B: Since n is a natural number, 3 is equal to 3 multiplied by the natural number n+1. So the sum of three consecutive natural numbers is a multiple of three!

Whoa! Crackle, crackle! (Applause)

⑦ Points to consider when thinking about these issues

Narrator:

In order to find out what is common among many things, to predict what will be true, and to show that the things will always be true, we can use character formula like the ones we have learned.

It is important to create a character formula that represents the number to be used In accordance with what needs to be shown.

The important thing is!

What does n represent?

What do n+1 and n+2 represent? the most important thing is to understand what is going on.

In addition, when thinking about the meaning of a letter formula, it is important to put specific numbers into the formula and think about it.

If you find it difficult to understand by matching one number, try matching several numbers and compare them.