

Lesson plan example using the «KINEMS: MATHLOONS» application



Lesson: Mathematics

Link to the curriculum: Mathematical sentences

Duration: 2 lessons x 80'

Grade: 2nd grade primary students

Learning context: General education (Mainstream classroom)

The lesson plan has been developed by:

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The sequence of learning activities

The following tables present the sequence of the learning activities for the learning unit, in relation to the learning goals and the attainment/adequacy targets.

Lesson1: Introduction to two-digit numbers addition, without regrouping

At the first lesson, students are introduced to the addition of two-digit numbers (TO+TO), without regrouping, utilizing various strategies and learning tools (with or without the use of technology).

Learning activity	Learning goals	Attainment targets/Adequacy targets
<p>Activity 1 The teacher asks students to take a look at the given investigation activity at page 21 of their textbook. The students are asked to work in pairs to observe the three representations that were used to solve the mathematical sentence “$52+36=88$”. After a while, a discussion takes place, where students explain the strategies used and in parallel they propose a different strategie to solve the mathematical sentence.</p> <p>Duration 15 minutes</p> <p>Classroom organization Pairs / Whole class discussion</p> <p>Materials</p> <ul style="list-style-type: none"> • Projector/PC to present the investigation activity • Student’s book, Part 3, Unit 7, page 21 	<p>The investigation activity works as an introductory activity, aiming to introduce students to the addition of two-digit numbers, without regrouping, through strategies development.</p>	<p>Attainment targets Nu.1.13 Students formulate and implement mental arithmetic strategies of addition and subtraction.</p> <p>Adequacy targets Students do mental arithmetic addition calculations (two-digit numbers, without regrouping) and subtraction calculations (two-digit numbers, without borrowing) utilizing various strategies.</p>
<p>Activity 2 Students work in 5 learning stations. In each station there are 3-4 students. The teacher explains how students should</p>	<p>This activity aims to support students understand the addition of two -digit numbers, without regrouping, using</p>	<p>Attainment targets Nu1.13 Students formulate and implement mental arithmetic strategies of addition and subtraction.</p>

Learning activity	Learning goals	Attainment targets/Adequacy targets
<p>work in each station. Also, s/he explains how the “Mathloons” game works and then s/he does a demonstration.</p> <p>Learning station 1: “Mathloons” Kinems suite embodied learning game.</p> <p>Learning station 2: Student’s book, page 22. The students solve mathematical sentences, using various strategies. Then, working in pairs, they choose one mathematical sentence in order to create a mathematical problem.</p> <p>Learning station 3: Student’s book, page 23. The students use Dienes cubes to solve the mathematical sentences. If the students complete the activity earlier, then each student will create 2 mathematical sentences using the Dienes cubes and then their pair will have to solve them. The students are writing down the mathematical sentences on their personal notepad.</p> <p>Learning station 4: Cards with mathematical sentences. Example: “Make the number 23. Add 12 more. What’s the solution?” The students are asked to draw (they draw Dienes cubes) the two-digit numbers on their personal blackboards and then find the solution. The students work in pairs.</p> <p>Learning station 5: Visualizing two-digit numbers for the construction of mathematical</p>	<p>various strategies and learning tools.</p>	<p>Nu1.12 Students calculate the sum and the difference within the ten and the multiple numbers from 10 to 100.</p> <p>Nu2.11 Students represent addition, subtraction, multiplication, division with and without remainder, using materials like Dienes cubes, pictures, digital applications and symbols.</p> <p>Adequacy targets Students do mental arithmetic addition calculations (two-digit numbers, with and without regrouping) and subtraction calculations (two-digit numbers, with and without borrowing) using strategies.</p> <p>Students represent addition and subtraction in different cases.</p>

Learning activity	Learning goals	Attainment targets/Adequacy targets
<p>sentences. Students are working in pairs. Each student has one play dough ball with two sticks on it. The first stick represents the ones and the second stick represents the tens. Also, they have green straws for ones and red straws for tens, cut in small pieces. Each student is called to visualize his/her two-digit number and add it with his/her pair. Students are writing down their mathematical sentences in order to solve them.</p> <p>Duration 55 minutes (5 minutes for the teacher to explain the learning stations and 10 minutes X 5 learning stations = 50 minutes)</p> <p>Classroom organization In learning stations - Groups 3-4 students: Individually/ Dyads</p> <p>Materials</p> <ul style="list-style-type: none"> • Learning station 1: KINEMS suite embodied learning game «Mathloons» • Learning station 2: Student's book, Part 3, Unit 7, page 22 • Learning station 3: Student's book, Part 3, Unit 7, page 23, Dienes cubes, 2 small blackboards, 2 whiteboard markers • Learning station 4: 10 scenario cards, 2 small blackboards, 2 white board markers • Learning station 5: 4 play dough balls 8 sticks, green and red straws (in small pieces), 2 small 		

Learning activity	Learning goals	Attainment targets/Adequacy targets
<p>blackboards, 2 whiteboard markers</p> <p>Activity 3 The teacher prompt students to have a whole class discussion. The student's book is displayed, via the projector, page 24, exercise 3 and 4. Students are working individually. Then teacher asked the students to discuss their solutions.</p> <p>Duration 10 minutes</p> <p>Classroom organization Individually/ Whole class discussion</p> <p>Materials:</p> <ul style="list-style-type: none"> • Student's book, page 24, exercise 3 and 4. 	<p>This is an evaluation activity, where the teacher has the opportunity to find any misconceptions students might still have but also their learning gains.</p>	<p>Attainment targets Nu1.12 Students calculate sum and difference within the ten and multiple numbers from 10 to 100.</p> <p>Adequacy targets Students do mental arithmetic addition calculations (two-digit numbers, with and without regrouping) and subtraction calculations (two-digit numbers, with and without borrowing) using strategies.</p>

Tips for a successful lesson implementation

General information: To keep your activities running smoothly, within the established time frames, it's important for the teacher to:

- Be familiar with KINEMS suite embodied learning game “Mathloons” (It is clarified that only one student will be able to use the game each time -The rest of the students need to be away from KINECT’s field of view).
- Set up the equipment (kinect camera, computer, projector) and “Mathloons” digital application before the lesson.
- Classify all the materials needed for the activities and especially, to keep the learning stations running smoothly.
- Divide students in groups before the lesson. Here, it would be useful to include a student coming from special education in each group. In this way, the student will take part in a supportive system during the activities and the teacher creates opportunities both for his/her inclusion and acceptance.
- Study the lesson plan carefully in collaboration with the special education teacher and have assigned tasks, keeping always in mind their special education students’ needs.

Activity 1: It is important for the teacher to give enough time to the students to investigate different ways and tools that were used for the proposed solutions (Student’s book, unit 7, page 21) as well as to explain their thinking. The teacher supports the process in order to make clear how students should work when adding two-digit numbers, without regrouping.

Activity 2: The teacher has to organize the learning stations before the lesson. At each learning station, the teacher should place a card with instructions, explaining the current task. Teacher’s support is crucial especially at the “Mathloons” embodied learning game learning station. The game settings for “Mathloons” are the following: 5 questions per student, Timer: 30 seconds for each question, Number type: natural, Game type: Addition, Game difficulty: Easy, Number range: 1-100. The teacher should also clarify that when a student is playing with the game, the rest of the students need to provide feedback and be active, encouraging the player to find the solution using the right strategy. Focusing on the students with disabilities, is recommended not to be the first ones to play the game so that they can imitate and follow the example of the other students. In this way students with disability might have a more positive attitude towards the game.

The special education teacher could provide support the rest of the learning stations.

Lesson 2: Introduction to two-digit numbers subtraction, without borrowing

At the second lesson, students are introduced to the subtraction calculation of two-digits, without borrowing, using various strategies and tools (with and without the use of technology)

Learning activity	Learning goals	Attainment targets/Adequacy targets
<p>Activity 1 During this exploration activity, students are asked to find different ways to calculate the difference in the following mathematical sentence «$35-24=\square$», in the student's book, page 25. The students can use the arithmetic line or the numbers' table. Students are working individually and then a discussion takes place.</p> <p>Duration 15 minutes</p> <p>Classroom organization Individually/ Whole class discussion</p> <p>Materilas</p> <ul style="list-style-type: none"> • Projector & Computer to present the exploration activity. • Student's book, unit 7, page 25. • Arithmetic line for each student. • Numbers' table for each student (from 1 to 100). 	<p>This exploration activity serves as an introductory activity to capture students' interest.</p>	<p>Attainment targets Nu.1.13 Students formulate and implement mental arithmetic strategies of addition and subtraction.</p> <p>Adequacy targets Students do mental arithmetic addition calculations (two-digit numbers, without regrouping) and subtraction calculations (two-digit numbers, without borrowing) utilizing strategies.</p>
<p>Activity 2 Students are divided in 5 learning stations. In each learning stations there are 3-4 students. The teacher explains to students how they should work in each learning</p>	<p>This activity aims to support students understand the subtraction of two-digits, without borrowing, using various strategies and tools.</p>	<p>Attainment targets Nu1.13 Students formulate and implement mental arithmetic strategies of addition and subtraction.</p> <p>Nu1.12 Students calculate the</p>

station. Also, the teacher explains the embodied learning game “Mathloons” and does a demonstration.

Learning station 1: KINEMS suite embodied learning game “Mathloons”.

Learning station 2: Student’s book, unit 7, page 26. The students are asked to solve the mathematical sentences. Students can use the arithmetic line as well as the number table (1-100). However, students choose the strategies they would like to implement. Then, each student makes 3 mathematical sentences and his/her pair is called to solve those using strategies.

Learning station 3: Student’s book, unit 7, page 27. Students are called to solve mathematical sentences vertically and horizontally. Then, they solve the two mathematical problems in pairs. The teachers in encouraging students to explain their thinking.

Learning station 4: Students are constructing two -digits numbers and then they are creating mathematical sentences using the Dienes cubes. It is expected to construct up to 10 mathematical sentences. Students are writing down the mathematical sentences on their personal blackboard, they solve them, and then they exchange those mathematical sentences with their pair to solve them.

Learning station 5: Digital

sum and the difference within the ten and the multiple numbers from 10 to 100.

Nu2.11 Students represent addition, subtraction, multiplication, division with and without remainder, using materials like Dienes cubes, pictures, digital applications and symbols.

Adequacy targets

Students do mental arithmetic addition calculations (two-digit numbers, with and without regrouping) and subtraction calculations (two-digit numbers, with and without borrowing) using strategies.

Students represent addition and subtraction in different cases.

applications. Students are practicing subtraction through various mathematical sentences.

Duration

55 minutes (5 minutes for the teacher to explain the learning stations and 10 minutes X 5 learning stations = 50 minutes)

Classroom organization

In learning stations - Groups
3-4 students: Individually or in dyads

Material

Learning station 1: KINESM suite embodied learning game “Mathloons”

Learning station 2: Student’s book, unit 7, page 26.

Learning station 3: Student’s book, unit 7, page 27.

Learning station 4: Dienes cubes, 4 small blackboards, 4 whiteboard markers.

Learning station 5: Digital applications in the computer.

Activity 3

The teacher gives 10 cards to each student. On each card there is a mathematical sentence and each student is called to draw with the same color, those that have the same result. (E.g. $27-3$ gives the same result as $20+14$). Students are called to explain their way of thinking.

Duration

10 minutes

This is an evaluation activity, where the teacher has the opportunity to find any misconceptions students might still have but also their learning gains from the first and the second lesson.

Attainment targets

Nu1.12
Students calculate sum and difference within the ten and multiple numbers from 10 to 100.

Adequacy targets

Students do mental arithmetic addition calculations (two-digit numbers, with and without regrouping) and subtraction calculations (two-digit numbers, with and without borrowing) using strategies.

Classroom organization
Individually/ Whole class
discussion

Tips for a successful lesson implementation

General information: To keep your activities running smoothly, within the established time frames, it's important for the teacher to:

- Be familiar with KINEMS suite embodied learning game “Mathloons” (It is clarified that only one student will be able to use the game each time -The rest of the students need to be away from KINECT’s field of view).
- Set up the equipment (kinect camera, computer, projector) and “Mathloons” digital application before the lesson.
- Classify all the materials needed for the activities (ahead of time) and especially to keep the learning stations running smoothly.
- Divide students in groups before the lesson. Here, it would be useful to include a student coming from special education in each group. In this way, the student will take part in a supportive system during the activities and the teacher creates opportunities both for his/her inclusion and acceptance.
- Study the lesson plan carefully in collaboration with the special education teacher and have assigned tasks, keeping always in mind their special education students’ needs.

Activity1: During this activity, it's important for the students to have the time needed to develop various strategies in order to solve the exploration activity and then to elaborate on their thinking. The teacher is supporting the process in order to make clear how students should work, in subtraction of two-digit numbers, without borrowing.

Activity 2: Teacher has to organize the classroom in learning stations before the lesson. At each learning station, the teacher should place a card with instructions, explaining the task. Teacher support is crucial especially at the “Mathloons” embodied game learning station. The game settings for “Mathloons” are the following: 5 questions per student, Timer: 30 seconds for each question, Number type: natural, Game type: Subtraction, Game difficulty: Easy, Number range: 1-100. The teacher is clarifying that when a student is playing with the game, the rest of the students have to provide feedback and be active, imitating the given expression every time. Focusing on the students with disabilities, is recommended not to be the first ones to play the game so that they can imitate and follow the example of the other students. In this way students with disability might have a more positive attitude towards the game

Activity 3: The teacher makes sure that students are working individually, in order to evaluate their academic performance.

The special education teacher could provide support the rest of the learning stations.