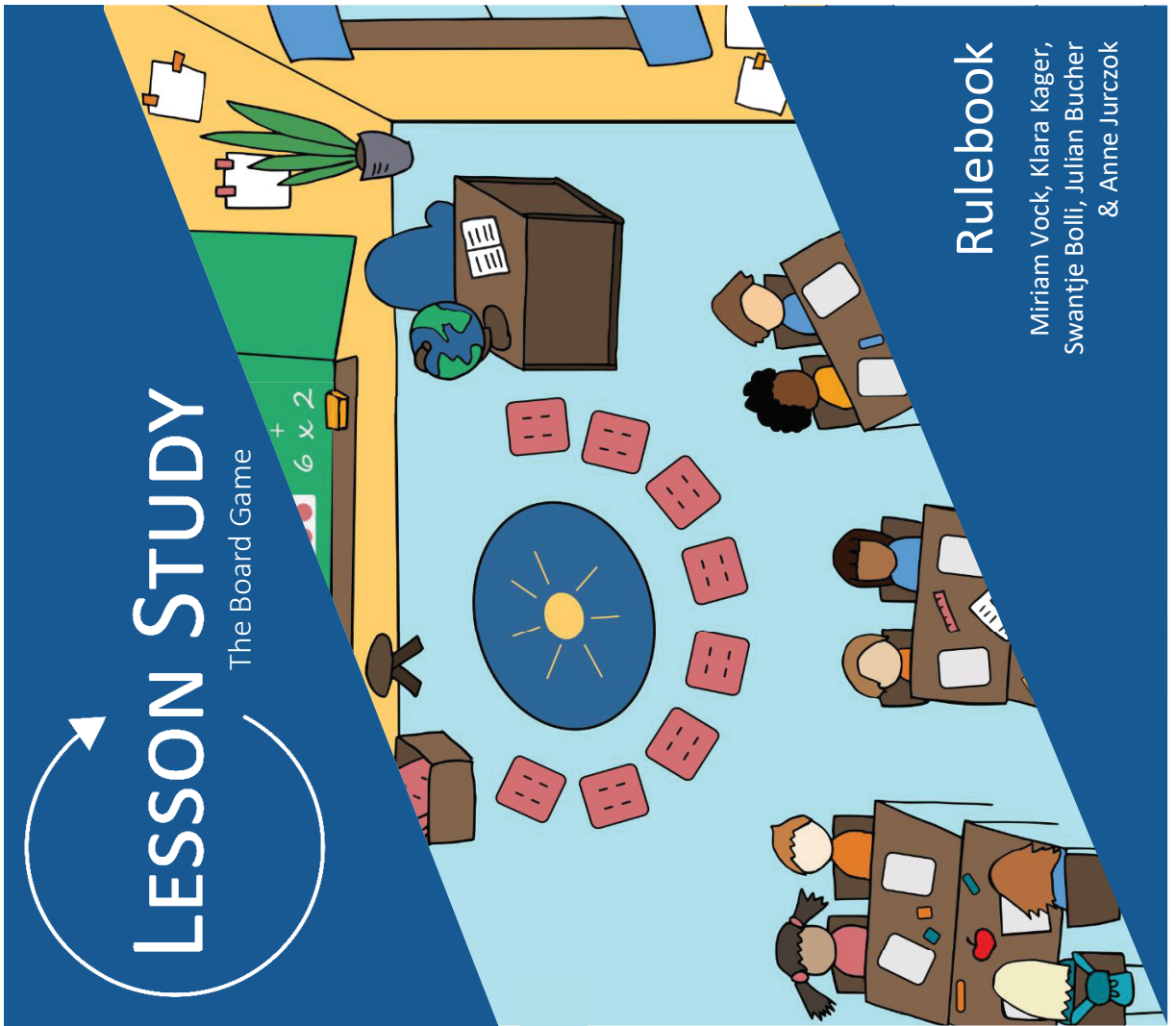


# LESSON STUDY

The Board Game



## Rulebook

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& Anne Jurczok

## Product imprint

"Leistung macht Schule" ("Excellence in School Education") is a nationwide project organized by the German Research Association of the Federal Ministry of Education (BMBWF). The overall goal of the initiative is to promote high-achieving and potentially high-achieving students in the classroom. The research team from the university of Potsdam led the component project "Lesson Study" in the first funding stage of the project (2018 to mid-2023). This board game was developed by the research team at the University of Potsdam together with project schools.

The board game is published as a free and open-access product of the BMBWF-funded research network "Leistung macht Schule".

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### Image credits:

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 In the second stage, the team examines various teaching materials and resources and collaboratively plans a lesson. This lesson is referred to as the research lesson.

 In the third stage, one team member teaches the research lesson to their class while the others observe the students' learning. The observing teachers take detailed notes on how students respond to the lesson and engage in assignments.

 In the fourth stage, the so-called post-lesson discussion, the team gets together to reflect on the research lesson. They discuss their observation notes on how students learned and look for answers to their research question. The goal is to arrive at concrete take-aways from the lesson that will help teachers to improve their daily practice.

You want to learn about Lesson Study? Visit our website:

**Lesson Study Website of the University of Potsdam**  
[www.uni-potsdam.de/lesson-study](http://www.uni-potsdam.de/lesson-study)



## Rules

### Introduction

Today you are assuming the role of the Lesson Study team of the Humboldt Primary School. By playing this game, you take on a new perspective, engage in every step of a Lesson Study process, and experience this real-world example for yourself.

Lesson Study is a **collaborative approach to teachers' professional development** that focuses on **student learning**. Each Lesson Study process revolves around a challenge or question that teachers have about their own practice. If you would like to read more about Lesson Study before you begin playing the game, you can find more information on page 6 in this rule book. You can also start playing the game right away.

### Goal of the game

The goal of this collaborative game is for you to get to know the four stages of the Lesson Study process and consider how this method could be useful to your own practice. Throughout the game, you follow the steps of a typical Lesson Study process and complete various tasks. You play as a team and also win as a team.

The game is based on a real Lesson Study process that was conducted at a primary school in Germany. Certain details have been altered or modified, including the lesson plan and the students' names and characters. The main focus of the game lies on Lesson Study; the mathematical content of the Lesson Study process is therefore secondary.

**The game is designed for teachers of all subject areas.**



## ⇨ Game components

You will find the following game components in the box:

- 1 board
- 1 lesson plan
- 1 logbook
- 19 action cards
- 4 teacher cards
- 12 quiz cards
- 5 student cards
- 5 observation cards
- 5 learning activity curves
- 5 explanation cards
- 14 victory points
- 1 token

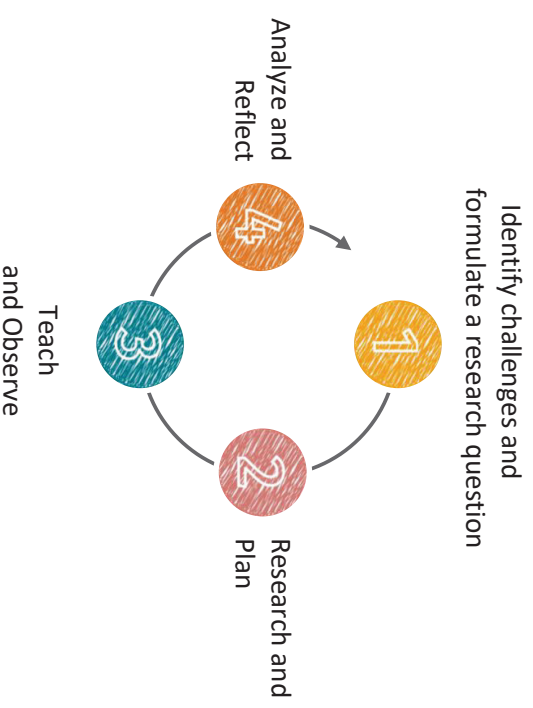
## ⇨ Game duration

The game can be completed in about **2-3 hours**, depending on the number of players. You can choose to follow the time recommendations provided on the action cards or, if you are not pressed for time, you can decide to go into greater depth in your discussions. Sharing and discussing ideas is the essence of this game, so look for a quiet place where you can play without any interrupts.

You don't have two hours to spare at once? You can also play the game in **two sessions**. A good time to pause is before stage 3 (action card 10).

## ⇨ A brief overview of lesson study

Lesson Study is a **collaborative** and **iterative** approach to **teachers' professional development**. While Lesson Study has its origins in Japan, today educators all over the world use Lesson Study as a way to develop and innovate their instructions. The goal of Lesson Study is for a team of teachers to exchange and generate ideas, plan lessons together, and examine the impact this lesson has on students' learning. A Lesson Study process typically consists of **four stages**.



1 In the first stage, the team members share their experiences about a certain topic with each other and select a specific focus and research question for their Lesson Study process. This focus usually aligns with the school's long-term goals and should be interesting to all team members.





## More about Lesson Study

### What happens after the game?

Now that you have finished the game, you know what Lesson Study is and how a typical Lesson Study process looks like **in practice!** The next step would be to consider how Lesson Study might be implemented at your school.

### Background of the game

The board game was developed as part of the Germany-wide initiative "Leistung macht Schule" ("Excellence in School Education") at the University of Potsdam. The goal of the game is to provide interested educators with **practical and self-directed** insights into Lesson Study in a short time.

"Lesson Study - The Board Game" can serve as an **introduction** to teachers who are new to Lesson Study, but it can also be used to practice the systematic observation of student learning and critical reflection in a team.

On the following two pages you can find some more information on Lesson Study and each of its stages.



### Number of players

The game can be played by a team of **3–6** educators.

### **We recommend playing the game with at least 4 people.**

Before gameplay can begin, choose the player who will take on the additional **role of the game leader**. Throughout the game, this person reads out the action and quiz cards, keeps track of the time and moderates the discussions. No prior knowledge of Lesson Study is needed for that role. The game leader is a normal participant of the Lesson Study team despite the additional tasks.

**If you are playing the game as part of a workshop**, then the workshop instructor takes on the role of the game leader. In this case, the game leader is not part of the Lesson Study team, but serves as a facilitator. If the Lesson Study team consists of only three people, however, the trainer can also be part of the Lesson Study team. We recommend that the instructor then takes on the role of the main teacher during the course of the game.

### Set up

- 1) To set up the game, place the **board** in the center of the table and place the token on the start space.
- 2) Sort the **quiz cards** and **action cards** according to their numbering in ascending order. Place both piles next to the board so that card number 1 is visible on both piles.
- 3) Depending on the size of your Lesson Study team, **leave** the following student cards, explanation cards, and learning activity curves **inside the box**:



- a. 6 team members: none
  - b. 5 team members: Emira (yellow)
  - c. 4 team members: Ahmad (green) and Zoe (purple)
  - d. 3 team members: Ahmad (green), Zoe (purple), and Emira (yellow)
- 4) Place the **lesson plan**, the **student cards**, the **explanation cards**, the **teacher cards**, the **learning activity curve cards**, the **victory points**, and the **logbook** next to the board. Prepare a pencil and, if needed, a watch to keep time.




#### How to play

Gameplay begins with the game leader moving the token to the first space and drawing the first **action card**. The game leader reads out the action card for the whole team. Once the team has completed all tasks, the game leader moves the token to the next space and takes the next action card.

If the token moves to a **quiz space**, the game leader reads out the quiz questions of the respective stage (three questions per stage). The team receives one victory point for each correct answer. Once all three quiz questions have been answered, the game leader moves the token to the next space and takes the next action card.

You can take breaks anytime.

You will find the following symbols on the action cards:


-  This symbol indicates an action for the team.
-  This symbol indicates that you should write something down in the logbook.
-  This symbol the approximate amount of time you should spend on a particular action. If necessary, you can keep track with a watch.



Now move your token to the first space and draw the first action card.  
**This is the start of the game!**

#### End of the game

The game is over once you move the token to the end space. The game leader reads out the last action card. The team members count the victory points they have collected during the game. Check the box to see how much you have learned about Lesson Study:

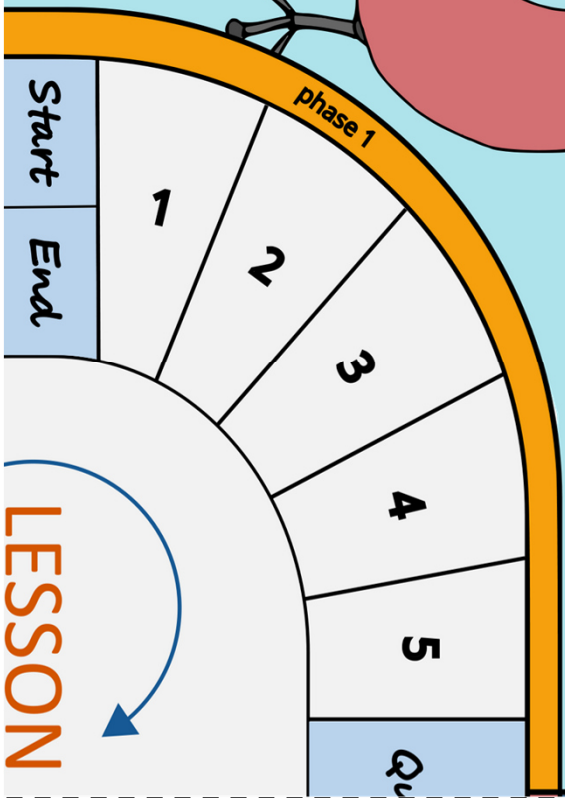
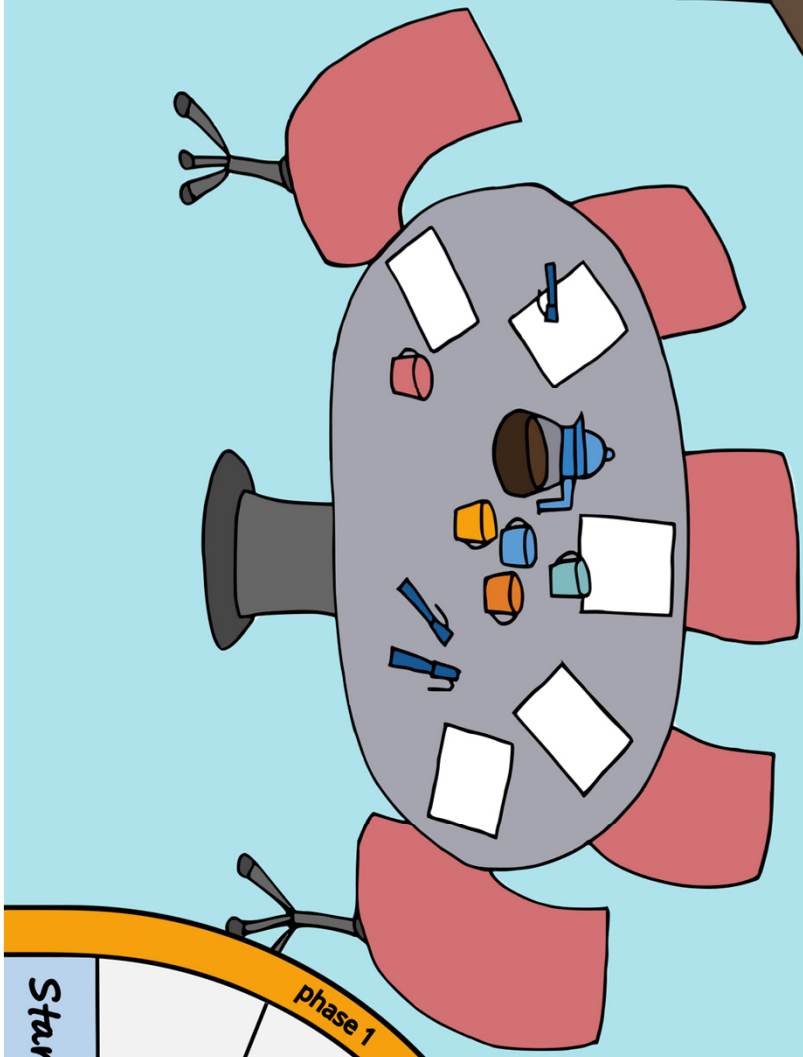


Less than 5 victory points:	This is a good start!
5 to 10 victory points:	Great teamwork – you are almost there!
More than 10 victory points:	Strong result – you are Lesson Study experts!



- Norwys
- have positive expectations
  - don't interrupt each other
  - listen to everyone's ideas
  - give constructive feedback

How can we appropriately challenge students who are already proficient with multiplication tables?



Glue here

Cut here



Glue here



I plan my lessons...

2 years prior

2 weeks prior

the evening on the same day before

using basic multiplications  
(1s, 2s, 5s, 10s)  
to solve unknown  
multiplications

**task 4 x 7**

solution path 1

$$4 \times 7 = 4 \times 5 + 4 \times 2$$

$$= 20 + 8 = 28$$

solution path 2

$$4 \times 7 = 2 \times 7 + 2 \times 7$$

$$= 7 \times 2 + 7 \times 2$$

$$= 14 + 14 = 28$$

STUDY

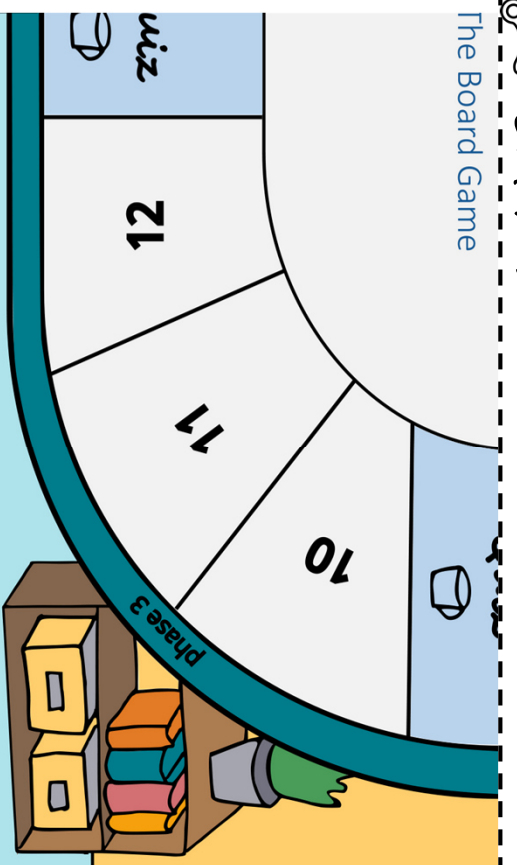
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The Board Game



Glue here

Noah

Zoe

Ahmad

Hannah

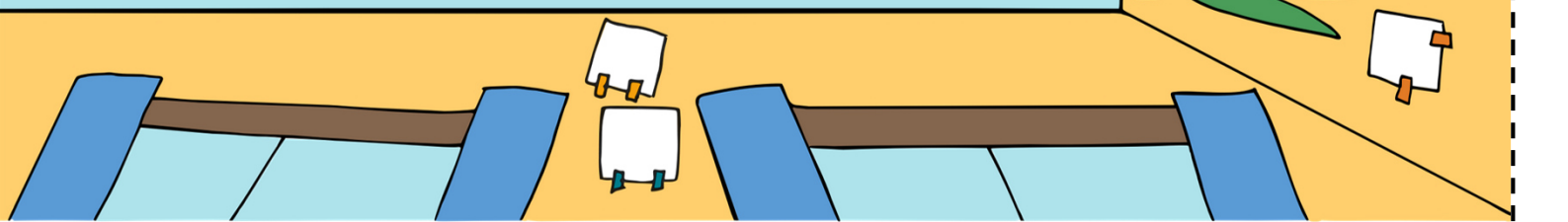
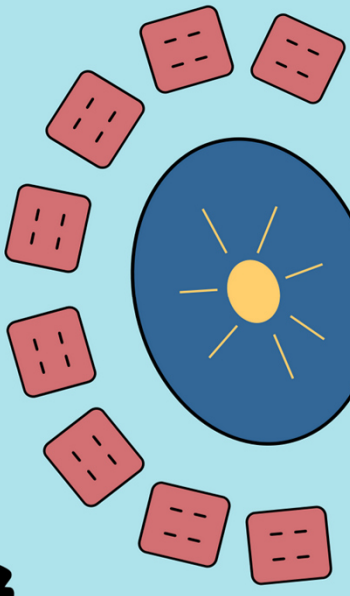
Emira

3 X 6

6 x 1

6 x 2

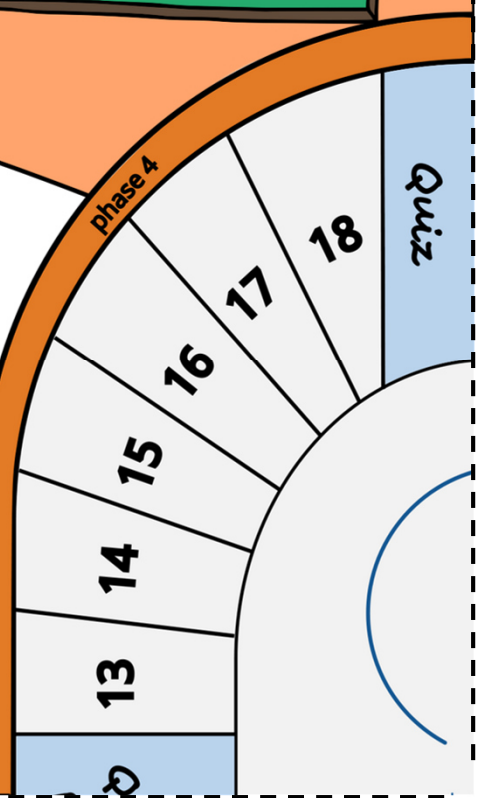
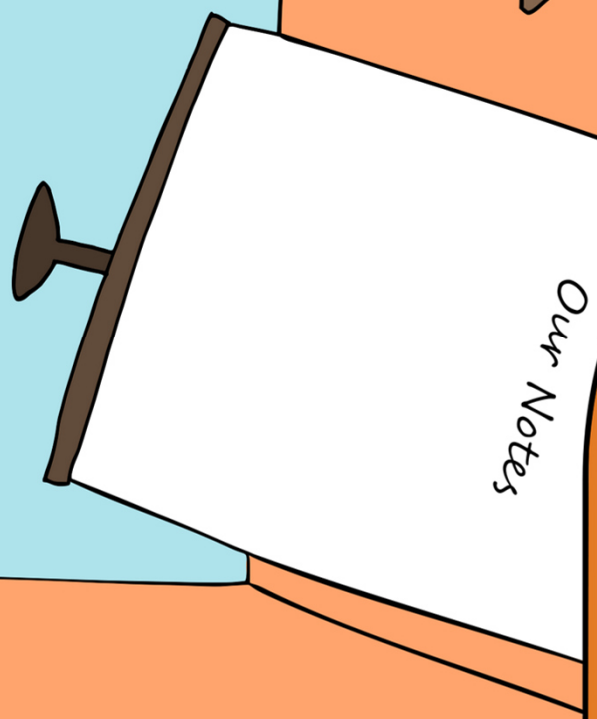
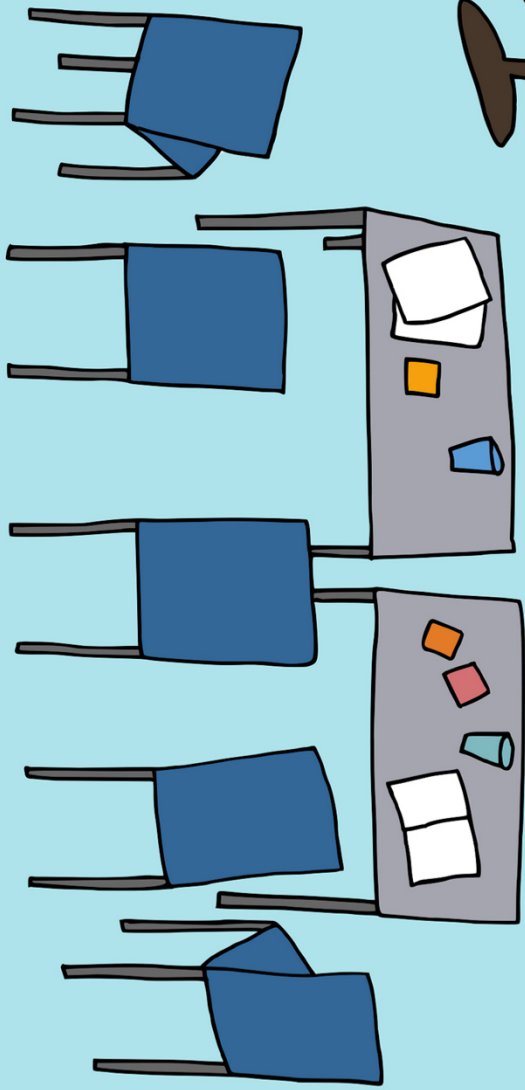
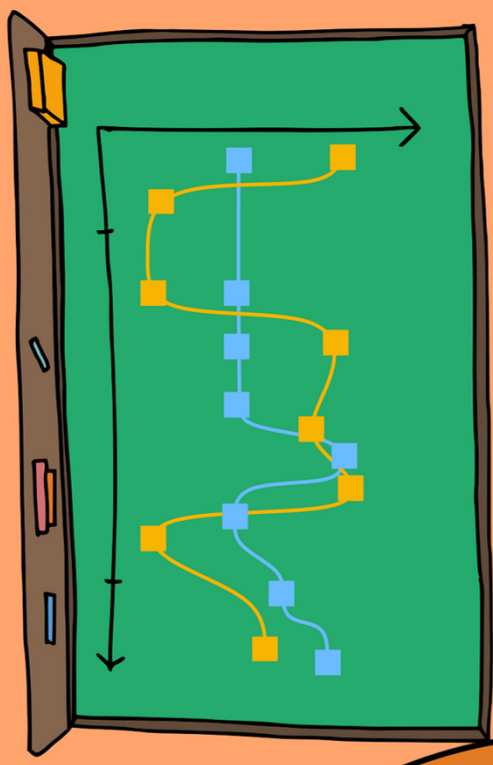
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Cut here ✂

- ### Agenda
- General impressions
  - Describing
  - Explaining
  - Looking for solutions



Cut here ✂

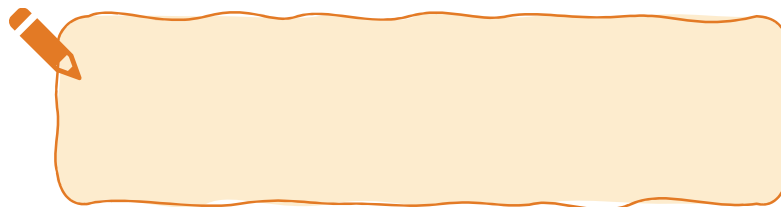


# Lesson Study – The Board Game

## Logbook



of



Stage 1: Identify challenges and formulate a research question

Action card 2:

Our five shared **norms** for our collaboration as a Lesson Study team are:

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_

## Stage 2: Research and plan

### Action card 6:

What are the benefits of planning lessons together?

Write down your answers.

### Action card 8:

What learning behaviors do you expect from the advanced students?

Write down your answers.



## Stage 3: Teach and observe

### Action card 11:

Have a look at the following observation notes. Are these notes descriptions or rather interpretations of learning behavior?

Check your solutions on the next page.

09:05  
keeps glancing at  
the tip cards, but  
does not get up to  
get one

1

- Description
- Interpretation

08:48  
raises hand,  
teacher calls on  
another student,  
turns away

2

- Description
- Interpretation

09:15  
is frustrated and  
very annoyed

3

- Description
- Interpretation

09:08  
proposes (wrong)  
solution path,  
uses  
mathematical  
terms

4

- Description
- Interpretation

09:15  
is bored by the  
task and is no  
longer paying any  
attention

5

- Description
- Interpretation

09:08  
has not  
understood the  
task

6

- Description
- Interpretation

09:05  
is too afraid to get  
up and get a tip  
card

7

- Description
- Interpretation

08:48  
says loudly, „Man,  
why is this not  
working?“

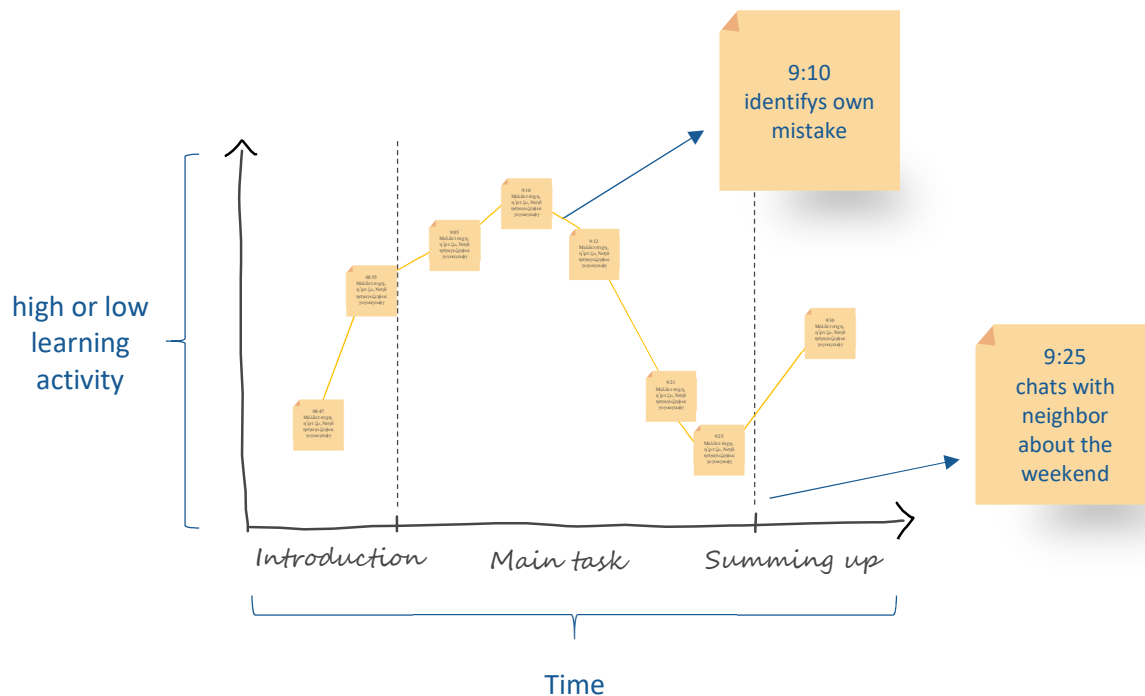
8

- Description
- Interpretation

## Stage 4: Analyze and reflect

### Action card 14:

Learning activity curves visualize the learning of each case student for the whole Lesson Study team. During the research lesson, teachers write down their observations on time-stamped sticky notes. In the post-lesson discussion, each teacher organizes their sticky notes into a coordinate system. The x-axis represents the time (i.e. phases of the lesson) and the y-axis represents the complexity of the students' exhibited learning activity (i.e. how challenging or how rewarding a student's activity is for their learning). The finished picture of all learning activity curves can help the Lesson Study team to reflect on their lesson plan and to discuss how the learning behavior of an individual student developed throughout the lesson or in comparison to other students.



**Take a look at the sticky notes from the previous exercise (page 3).** Where would you place the sticky notes that you **identified as descriptions** on the coordinate system? Would you rate the learning behavior described on the sticky note as rather high (i.e. the student was active and engaged) or low (i.e. the student was not engaged in the lesson)?

Note: Assessing learning behavior always involves interpretation and there are multiple different ways to organize notes into curves. The goal of using learning activity curves is to collaboratively and critically discuss students' learning and evaluate as a team how effective these learning activities were.

### Action card 16:

Write down possible explanations for the learning behavior of your case students.



Example:

The reason why Noah could not completely solve the exercise was a lack of time.

### Action card 17:

Read through the suggestions below. Discuss as a team whether some or all case students would benefit from some of these ideas? Can you think of additional solutions?



1. In the future, we need to make sure that students have enough time to work on challenging tasks.
2. We should make the tip cards more accessible to students.
3. We should let advanced students work in small groups more often, but we also need to provide more support to them, especially in the beginning.
4. Sometimes we should assign tasks to students, instead of letting students chose their task.
5. We should have a conversation with our students about what success to them and how they can cope with failure.



## Lesson plan

Time	Activities	Role of the teacher	Student's learning activities	Materials
10 min	<p><u>Introduction</u> students gather in a circle around the blackboard</p>	<ul style="list-style-type: none"> <li>Teacher introduces lesson goal: To use basic multiplications to derive unknown multiplications</li> <li>Practice: Flipping tasks               <ul style="list-style-type: none"> <li>Question: "Can you flip <math>2 \times 6</math>?"</li> <li>Question: "Can you flip <math>1 \times 6</math>?"</li> </ul> </li> <li>New content: Teacher puts 3 lines of 6 dots each on the black board               <ul style="list-style-type: none"> <li>Question: "What multiplication are we looking for?"</li> <li>Teacher notes students' solutions on the blackboard</li> </ul> </li> <li>Teacher explains how an unknown multiplication can be decomposed into two basic multiplications</li> <li>Question: „How can we decompose <math>3 \times 6</math>?"</li> </ul>	<ul style="list-style-type: none"> <li>Students listen carefully</li> <li>Students answer question: <math>2 \times 6 = 6 \times 2</math></li> <li>Students answer question: <math>1 \times 6 = 6 \times 1</math></li> <li>Students identify the multiplication: <math>3 \times 6</math></li> <li>Students listens carefully</li> <li>Students understand that <math>3 \times 6</math> can be decomposed to <math>2 \times 6 + 1 \times 6</math> or <math>6 \times 2 + 6 \times 1</math></li> </ul>	blackboard, lines of dots, magnets, chalk
25 min	<p><u>Main task</u> Advanced students: work independently in small groups</p> <p>Class: plenary discussion, students practice on their own</p>	<p>Advanced students:</p> <ul style="list-style-type: none"> <li>Teacher offers group work to advanced students</li> <li>Students form two groups and receive material box and the task (<b>backside</b>)</li> <li>Teachers tells students that they may use tip card that are placed on the teacher's desk</li> </ul> <p>Class:</p> <ul style="list-style-type: none"> <li>Teacher models another task (<math>6 \times 6</math>) for everyone on the blackboard</li> <li>Students independently work on exercises in the workbook</li> <li>Teacher circulates through class and provides support</li> </ul>	<p>Advanced students:</p> <div style="border: 2px solid orange; width: 100px; height: 100px; margin: 10px auto; display: flex; align-items: center; justify-content: center;"> <span style="font-size: 48px; color: orange;">?</span> </div> <p>Class:</p> <ul style="list-style-type: none"> <li>Students listen and answer questions</li> <li>Students solve exercise by themselves in the workbook, check their own solutions</li> <li>Students may ask the teacher for help</li> </ul>	<p>Material boxes: poster, colorful pens, Lines with dots, scissors,</p> <p>blackboard, lines with dots, magnets, chalk, workbook</p>
10 min	<p><u>Summing up</u> Whole class, Groups present their posters</p>	<ul style="list-style-type: none"> <li>Teacher puts up the posters on the blackboard and moderates the presentations</li> </ul>	<ul style="list-style-type: none"> <li>Groups present their posters and explain clearly their solution</li> <li>Students listen to the poster presentations and ask questions</li> </ul>	blackboard, magnets, posters from group work

## Task

Solve **4x7** by using the 2s, 5s, or 10s.

Write down your solution and your solution path.

Are there more than one possible paths?

Illustrate your solution path on a poster.

Present the poster at the end of the lesson to the class.



## Stage 1: Quiz

**Question:** What is the final product of the first Lesson Study stage?

- a) A lesson plan
- b) A research question
- c) An essay about the Lesson Study method
- d) A to-do list for the next school year

Answer: b) A research question

## Stage 1: Quiz

**Question:** The origins of Lesson Study can be traced to which country?

- a) USA
- b) Germany
- c) Japan
- d) South Korea

Answer: c) Japan

## Stage 1: Quiz

**Question:** What is main goal of Lesson Study?

- a) To develop a single exceptionally good lesson
- b) To learn more about instructions and student learning together as a team
- c) To develop a better structure for the preparation of lessons
- d) To show your students that many teachers are interested in your lessons

Answer: b) To learn more about instructions and student learning together as a team

## Stage 2: Quiz

**Question:** What is an important final product of the second stage?

- a) A jointly created lesson plan
- b) A written reflection of the research findings on the chosen topic
- c) A protocol
- d) A list of questions for future Lesson Study processes

Answer: a) A jointly created lesson plan



## Stage 2: Quiz

**Question:** Which team member should be selected to teach the research lesson?

- a) The most experienced teacher
- b) The youngest teacher
- c) A member of the (extended) school board
- d) There are no rules – volunteers welcome!

**Answer:** d) There are no rules – volunteers welcome!

## Stage 2: Quiz

**Question:** What resources could you use to learn more about your topic? *Multiple answers are possible.*

- a) Educational curricula
- b) Internal school curricula
- c) Journals and magazines
- d) Invite external people who have relevant expertise (e.g., school counselors, researchers, teachers from other schools)

**Answer:** All answers are correct.

## Stage 3: Quiz

**Question:** What should the observing teachers not do during the lesson?

- a) Take notes
- b) Observe the teacher
- c) Follow the classroom activities
- d) Talking to other observing teachers about their impressions

**Answer:** d) Talking to other observing teachers about their impressions

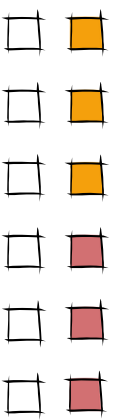
## Stage 3: Quiz

**Question:** What materials should the Lesson Study team bring with them on the day of the research lesson?

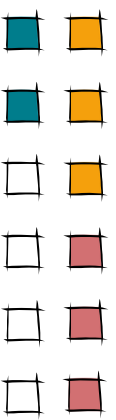
- a) Sticky notes
- b) Binoculars
- c) Camouflage clothing
- d) Coffee cup

**Answer:** a) Sticky notes

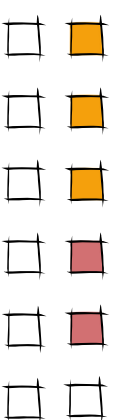
Stage 2: Quiz



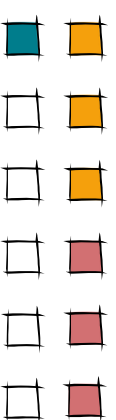
Stage 3: Quiz



Stage 2: Quiz



Stage 3: Quiz



### Stage 3: Quiz

**Question:** What should observing teachers write down on their sticky notes?

- a) Everything the class teacher says
- b) Their own emotions during the lesson
- c) Any time a student raises their hand
- d) The learning activities of selected students

**Answer:** d) The learning activities of selected students

### Stage 4: Quiz

**Question:** At the beginning of the fourth stage, who should be the first to comment on the research lesson?

- a) The youngest teacher
- b) The most experienced teacher
- c) The teacher who taught the lesson
- d) The school board

**Answer:** c) The teacher who taught the lesson

### Stage 4: Quiz

**Question:** What happens at the end of stage four?

- a) The team finds an answer to their research question
- b) The team interviews the case students
- c) The school board decides on the next steps
- d) The teacher who taught the lesson receives a grade for their teaching

**Answer:** a) The team finds an answer to their research question.

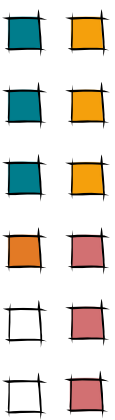
### Stage 4: Quiz

**Question:** What would be a good catchphrase for a Lesson Study project? *Multiple answers are possible.*

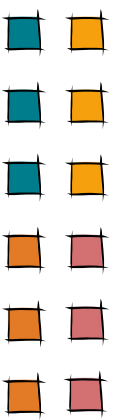
- a) „Together we're stronger.“
- b) „Teams build dreams.“
- c) „We're all better than one.“
- d) „After Lesson Study is before Lesson Study.“

**Answer:** All answers are correct.

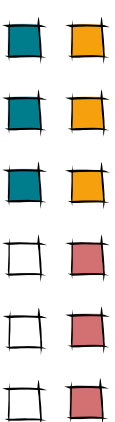
Stage 4: Quiz



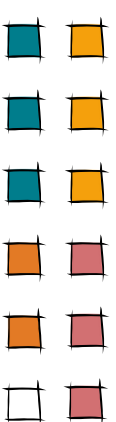
Stage 4: Quiz



Stage 3: Quiz



Stage 4: Quiz





## Action

01

Welcome to the Lesson Study team of the Humboldt Primary School! In the first stage of the Lesson Study process, you identify challenges in the classroom and find a research question together.

But before you begin, you want to get to know each other better as a team.


- Turn to the person on your right. How many years of teaching experience does this person already have? You may guess once before the person reveals the correct answer and turns to the person on their right. The team earns a victory point, if more than half of the guesses were correct.

Move to the next space.

## Action

02

A Lesson Study process is an ongoing and iterative process rather than a one-time event. Your discussions and the sharing of your personal experiences are the foundation of this collaboration. In order to work well together, it is helpful to assign roles and agree on arrangements for your teamwork.

- Select one person to be in charge of the logbook for this Lesson Study process. This person takes the logbook and documents the Lesson Study process when indicated by this symbol: 
- Agree on five norms for your collaboration. You can find some examples on the flipchart in the room of stage 1.

 Document these five norms in the logbook.

 5 minutes

Move to the next space.




## Action

03

In each Lesson Study process, you focus on a specific challenge or question. This question usually aligns with the school's long-term goal and should be of interest to all team members.

The long-term goal of the Humboldt Primary School is to ensure that all students are engaged in the learning process by providing tasks that match each individual's needs.

- What is your experience with the use of differentiated instructions? What specific challenges do you see in your classroom with regard to the varying skill levels of students? Share your experiences.

 5-10 minutes

Move to the next space.

## Action

04

One of you would like to share a specific challenge from their daily teaching practice with the Lesson Study team.

- Select one person to be the teacher of a 2nd grade at the Humboldt Primary School. This team member will later teach the collaboratively planned research lesson, while the other members observe how students learn. (*Note: In reality, this is usually not decided until Phase 2 of the Lesson Study cycle*).
- The selected person takes all of the teacher cards and immediately reads out the first card to the team.

Move to the next space.



## Teacher

01

„We are currently learning the multiplication table in my second grade. As described in the curriculum, we started by studying the easier multiplications: the 2s, 5s, and 10s.

As usual, I have a handful of quick learners that are able to immediately memorize these easy multiplications. Most of the others students, however, need a lot of practice and repetition.

I worry that as the repetitions go on, the faster students will grow disinterested and bored. This is why I would like to push these fast students and encourage them to independently solve more difficult multiplication problems for which they do not know the answers by heart.”

## Action

05

The team decides to take this teacher’s experience as a starting point for their Lesson Study process. They agree on the following research question:



How can we adequately challenge students who are already proficient with multiplication tables?

This concludes the first stage of the Lesson Study process!

- Go to the first quiz space. The game leader reads out each quiz question for stage 1 and the Lesson Study team answers each question collaboratively. For each correct answer, the team receives one victory point. This procedure applies to all quiz spaces.

Move to the next space.




## Action

06

The second stage of the Lesson Study process begins: Researching and planning! This phase is about gathering information on the selected topic or problem and developing a lesson plan.

- Every teacher has a different routine and way of planning their own lessons. Look at the blackboard in the room of the 2nd stage on the game board. Where are you standing on the line?
- Planning lessons together as a team has many benefits. Which ones come to your mind?

 Write down possible benefits in the logbook.

 5 minutes

Move to the next space.

## Action

07

The 2nd grade students are already familiar with a few basic multiplications: the 2s, 5s, and 10s. They also understand how to invert an exercise (e.g.  $2 \times 3$  equals  $3 \times 2$ ).

The next goal is for students to understand how to derive unknown multiplications using basic multiplications and the concept of number decomposition.

- Examine the exercise on the table in the room of stage 2. Share your ideas: What skills are required from students in order to solve the problem? Where might students make errors?

 5 minutes

Move to the next space.





## Action

The Lesson Study team prepares a lesson with two levels of differentiation to really push students who have already mastered the basic multiplications.

➤ Go over the lesson plan together. For advanced students, the column "students' learning activities" is currently empty for the main task. Fill in the gap together.

📎 Note your answer in the logbook.

🕒 5-10 minutes

Move to the next space.

## Action

The Lesson Study team conducts a pre-test before the research lesson. The test shows that four of your students have already mastered simple multiplication and also understand how to invert tasks and decompose numbers. These students will be the case students for this Lesson Study process and the team will closely observe their learning during the research lesson. The class teacher suggests to observe one additional student who was unable to participate in the pre-test because of illness.

➤ Each observer receives a student card and silently reads the card. After that, each observer briefly introduces their case student in their own words to the other and locates their case student in the classroom on the board.

🕒 5 minutes

Move to the next space.



## Action

10

The day of the research lesson has finally arrived! To ensure that everyone from the Lesson Study team could attend the research lesson, the principal helped to find replacement for each team member.

- Which team member has the most experience with observation in the classroom? Assign rankings from the least to the most experienced member.

Move to the next space.

## Action

11

A key component of the Lesson Study process is observing how students learn. It is, however, challenging to infer from the outside what is going on in students' minds. This is why the Lesson Study team focuses their observations on the visible learning behaviors of students. These overt activities can help to understand students' learning processes. It is important to observe with as much objectivity as possible and to prioritize description above interpretation.

- Complete the task in the logbook on p. 3.

 Take a victory point if you get more than half of the answers correct.

 5 minutes

Move to the next space.



## Action

12

During the research lesson, the team members make detailed notes of their case student's learning. Lesson Study teams around the world have developed numerous protocols that support their observations. At the Humboldt Primary School, you work with the so-called learning activity curves. Prior to the research lesson, the observing teachers each take a stack of sticky notes and assign a different color to their case student. They then note down every learning activity on a sticky note and label it with the time of the day. Each observer typically collects around 20 observations of their case student.

- Teachers now take the observation card of their respective student. The teacher who taught the lesson receives the 2nd teacher card. Read the cards silently and keep the information to yourself for now!

Move to the quiz space.

## Action

13

After the lesson, the team gets together for the final step of the Lesson Study process: The analysis and reflection of their observations. The specific steps of this stage are already written on the flipchart in the room of stage 4: Sharing your general impressions, describe your observations, identifying explanations for students' learning, and deciding on possible next steps.

- The teacher who taught the research lesson starts off the discussion by describing their general impressions of the lesson. The teacher now reads out the 2nd teacher card to the team.

Move to the next space.



"The lesson was really draining for me. It was quite obvious that the class's best students were no longer there when they began working on their assignment on their own. As I moved around the classroom, I could see that the class was struggling to solve the tasks and the students needed much more help than I had anticipated.


Since the advanced students worked in independent groups, I did not have a chance to see how they were getting on with their assignment. But I was quite surprised at the end of the lesson when they presented their posters. Neither group was able to solve the task completely. I didn't expect that and I am very curious to hear what you were able to observe about your case students. What happened?"

## Action

14

In a next step, team members describe how their case student learned during the lesson. Each team member attaches their colored sticky notes to the black board and thereby creates a learning activity curve for their student. The overlapping curves of all case students help the Lesson Study team to visualize students' learning over the course of the lesson.

- Look at the explanation of the learning activity curve in the logbook. Then return to the sticky notes in the logbook on p. 3 that you marked as "Observation". Discuss as a team: Would you place these sticky notes high or low on a learning activity curve?

 10 minutes

Move to the next space.





## Action


15

It's time to describe how the case students engaged with the task during the research lesson.

➤ Each team member receives the learning activity curve of their case student. Use the learning activity curves and the observation cards to talk about each case student:

- How did the student learn over the course of the lesson?
- What significant moment did you note down?

➤ The teacher receives the 3rd teacher card and immediately shares it with the team. Use this card as help to understand how the students approached the assignment.

 10 minutes


Move to the next space.


## Action

16

In a next step, the Lesson Study team wants to find possible reasons for the learning behavior they observed.

➤ Each observer receives the explanation card of their case student. Talk about possible explanations for the learning behavior you observed. Try to think outside the box and to consider various alternative explanations.

 Note down possible explanations in the logbook on p. 5. You can also find an example for what an explanation could look like.

 15 minutes

Move to the next space.



## Action

17

Finally, the Lesson Study team wants to derive specific solutions and ideas for their future practice. Think back to your research question for this Lesson Study process: How can we adequately challenge students who have prior knowledge concerning the multiplication table?

➤ Consider the solutions in the logbook on p. 5 and discuss additional ideas.

 10 Minutes

Move to the next space.

## Action

18

You have almost reached the end of the Lesson Study process! Before the post-lesson discussion is over, the teacher who taught the lesson summarizes the take-aways from this research lesson for the whole team.

➤ The teacher reads their fourth teacher card.

Move to the quiz field for stage 4.  
Then move to the end space and read the last action card.



“I now see the research lesson from a different angle. It was really interesting to hear your observations about how the case students approached the assignment. Thinking back to our research question, we did a pretty good job of pushing these students. I am sure that they could have completed the task with a little more time and assistance.

What we can take away from this lesson is that we should talk more openly with students about the fact that it is acceptable to not be able to finish a tricky task right away. Their goal should not be to solve as many tasks as possible, but to think hard about a problem, work through it, and being able to articulate your process.

What if we looked more closely at how students handle failure in the upcoming Lesson Study process?”

# Action

Congratulations, you have successfully completed your first Lesson Study process!

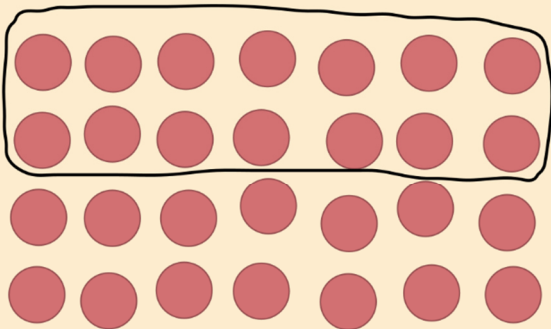
What happens next?

- Use the guide on p. 5 of the rule book to determine how many victory points you have earned!
- Did the game make you curious about Lesson Study? You can find more information on Lesson Study in the rule book on p. 6.



## Teacher

$$4 \cdot 7 = 28$$



Hannah &amp; Noah

$1 \cdot 1 = 1$	$1 \cdot 2 = 2$
$2 \cdot 1 = 2$	$2 \cdot 2 = 4$
$3 \cdot 1 = 3$	$3 \cdot 2 = 6$
$4 \cdot 1 = 4$	$4 \cdot 2 = 8$
$5 \cdot 1 = 5$	$5 \cdot 2 = 10$
$6 \cdot 1 = 6$	$6 \cdot 2 = 12$
$7 \cdot 1 = 7$	$7 \cdot 2 = 14$
$8 \cdot 1 = 8$	$8 \cdot 2 = 16$
$9 \cdot 1 = 9$	$9 \cdot 2 = 18$
$10 \cdot 1 = 10$	$10 \cdot 2 = 20$

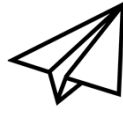
$$4 \cdot 7 = 7 \cdot 4 = 28$$

Ahmad &amp; Zoe





# Noah



*Student card*

Noah has a lot of prior knowledge in math and is regarded as the class's best mental calculator. He easily gets bored in lessons that center on repetition and practice. Often times, he simply writes down the solution of a task instead of recording the entire calculation in his notebook.

You can see that Noah works at a fast pace and likes to engage in complex content. The pre-test also verifies that he does not need to practice basic multiplication again.

# Noah



*Observation card*

Noah is working with Hannah. You write down the following notes about Noah:

- Introduction: He listens to the teacher, engages in the questions
- Main task: He reads the assignment together with Hannah, he solves the multiplication immediately in his head, he tells Hannah the solution and says: "I am sure the solution is correct, but we didn't solve it the way we are supposed to. We didn't use the 2s, 5s or 10s", he lists different multiplication tables and seems baffled, Hannah recapitulates the introduction of the lesson and he says: "Alright, now I know what we have to do!", he explains to Hannah that they need four lines of dots with seven dots each, he circles two of the lines, but the time is up
- Summing up: He leaves the presentation of the poster to Hannah, he listens to Hannah's explanations



# Noah



*Explanation card*

Discuss the following questions as a team:

- Why was Noah unable to solve the task completely?
- Noah demonstrates that he can reflect on the requirements of the task (write down the solution AND the path to the solution) and his deficits (he didn't use the basic multiplications to solve the assignment). What could this ability indicate?

# Hannah



*Student card*

Hannah frequently lacks focus when working on exercises by herself in math class. Sometimes she doesn't manage to complete the exercises. In other subjects, Hannah does exceptionally well, contributes significantly more to class discussions, and comes up with original ideas. You wonder whether Hannah's behavior in math class stems from boredom, a lack of understanding, or rather from the type of exercises that math class requires. You're curious to find out more about Hannah's skills and abilities.

Although Hannah missed the pre-test due to illness, you suggest to observe her more closely during the research lesson.



# Hannah



*Observation card*

Hannah is working with Noah. You write down the following notes about Hannah:

- Introduction: She looks at the teacher, remains silent during questions
- Main task: She reads the assignment together with Noah and is happy about Noah's quick solution, she neatly writes down the task and solution on the poster, but doesn't contribute any ideas herself, when Noah seems out of idea she describes the exercises from the beginning of the lesson, she sticks four lines of dots seven dots each on the poster
- Summing up: She presents the poster by herself and clearly and confidently explains the solution of  $4 \times 7$ , she explains that they needed four lines of dots with seven dots each, she asks the teacher whether they will be able to continue working on the task in the next lesson

# Hannah



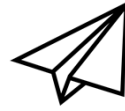
*Explanation card*

Discuss the following questions as a team:

- You selected Hannah as a case student to get to know her better. Do you believe that Hannah showed great math skills in this lesson? Why/why not?
- What strengths did Hannah demonstrate in this lesson?



# Emira



## *Student card*

Emira is a fast learner and usually finishes assignments before the rest of the class. Most of the time, her solutions are correct. She likes to present her solutions and her approach to problem-solving in front of the whole class.

You can see that Emira already possesses advanced math skills. The pre-test also verifies that she does not need to practice basic multiplication again.

# Emira



## *Observation card*

Emira decides against the group work. You write down the following notes about Emira:

- Introduction: She raises her hand to answer a question, but looks away as the teacher calls on another student
- Main task: She skims through the worksheet for the group work and decides against it, she plays with her sweater while the teacher shows the example on the blackboard, she then quickly begins to work on the tasks in the exercise book and checks her own solutions, she tells her neighbor that she solved all tasks correctly, she starts working on the decomposition of  $4 \times 6$ , she is not making any progress, she chats with her neighbor about the weekend
- Summing up: She listens to the presentations, when asked after the lesson why she decided against the group work, she says: "The group work was only one task. But there were plenty tasks in the exercise book and I didn't want to solve just one single task in a whole lesson."





# Emira



*Explanation card*

Discuss the following questions as a team:

- What could be the underlying reasons for Emira choosing not to participate in the group work?
- Do you think Emira learned something new in this lesson?

# Zoe



*Student card*

Zoe picks up new tasks and concepts quickly and is always very excited when her solutions are correct. You know from Zoe's parents that she proudly tells them about her good grades and the tricky problems that she works on in school.

You can see that Zoe is a highly motivated student who enjoys to learn new content. The pre-test also verifies that she does not need to practice basic multiplication again.



# Zoe



## Observation card

Zoe is working with Ahmad. You write down the following notes about Zoe:

- Introduction: She correctly answers some of the questions, listens to the answers of other students
- Main task: She reads through the work assignment with Ahmad and they quickly find the correct solution for  $4 \times 7$ , they verbally repeat the basic multiplication tables (2s, 5s, 10s), but they do not apply them to the task, she seems frustrated and re-reads the work assignment, she writes down the multiples of 1 and 2 in a corner of the poster and says: "Man, why doesn't this work!", just before the time is up she writes down the task ( $4 \times 7$ ) and the solution
- Summing up: She presents the poster by herself and stares at the floor the whole time, afterwards she takes the poster back to her desk and throws it to the ground

# Zoe



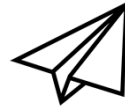
## Explanation card

Discuss the following questions as a team :

- Why does Zoe struggle to complete the whole assignment?
- Zoe is frustrated because she was not able to complete the whole assignment. What could be the reasons for Zoe's reaction?



# Ahmad



*Student card*

Ahmad frequently completes the exercises ahead of the majority of the class. He nevertheless works very accurately and usually arrives at the correct solutions. Ahmad is not very talkative in class and likes to keep to himself. He rarely engages in class discussions.

You can see that Ahmad has a lot of potential. The pre-test also verifies that he does not need to practice basic multiplication again.

# Ahmad



*Observation card*

Ahmad is working together with Zoe. You write down the following notes about Ahmad:

- Introduction: He looks at the teacher and listens to the other students, but does not actively participate in the discussion
- Main task: He reads through the work assignment together with Zoe and they quickly find the correct solution for  $4 \times 7$ , they verbally repeat the basic multiplication tables (2s, 5s, 10s), but they do not apply them to the task, he says: "If we flip  $4 \times 7$ , we get  $7 \times 4$ , but this doesn't help us", he falls silent while Zoe keeps trying to solve the task, he keeps looking at the the tip cards on the teacher's desk without getting up to get one
- Summing up: He asks Zoe to present the poster alone, during the presentation he looks at the floor and sits on his hands



# Ahmad



*Explanation card*

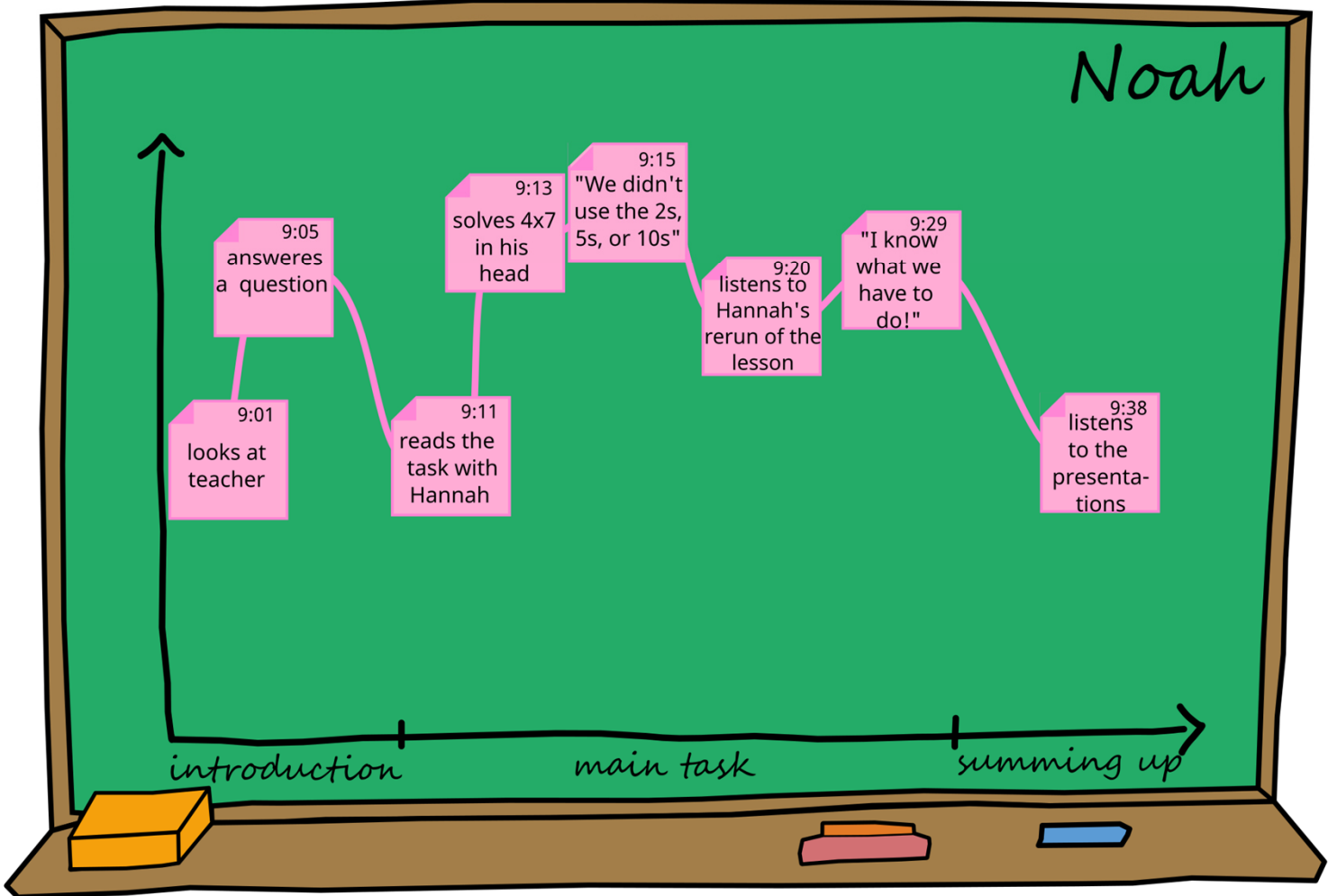
Discuss the following question as a team :

- In the beginning, Ahmad works well together with Zoe. Why does Ahmad stop contributing half way through?

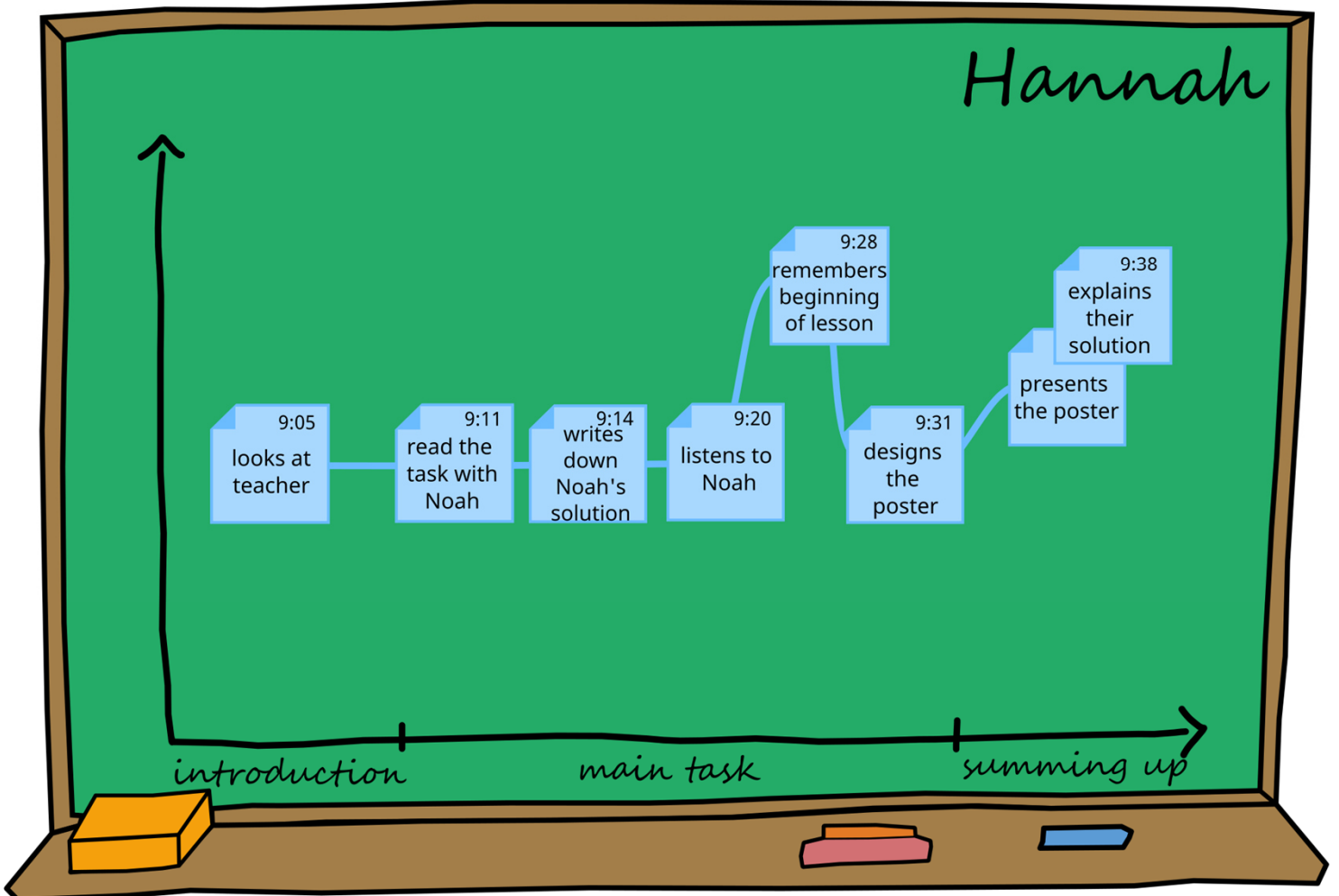




# learning activity curve

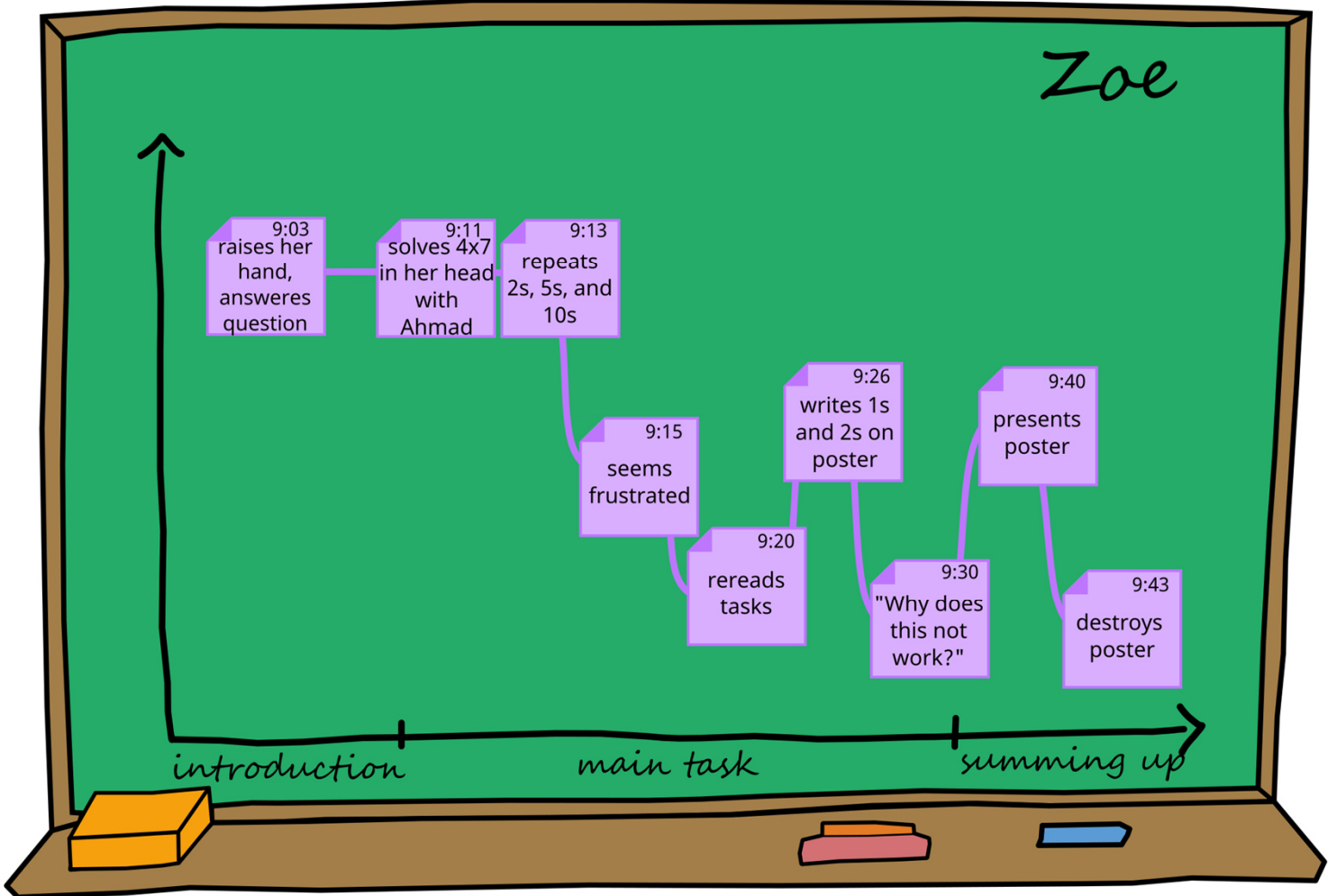


# learning activity curve

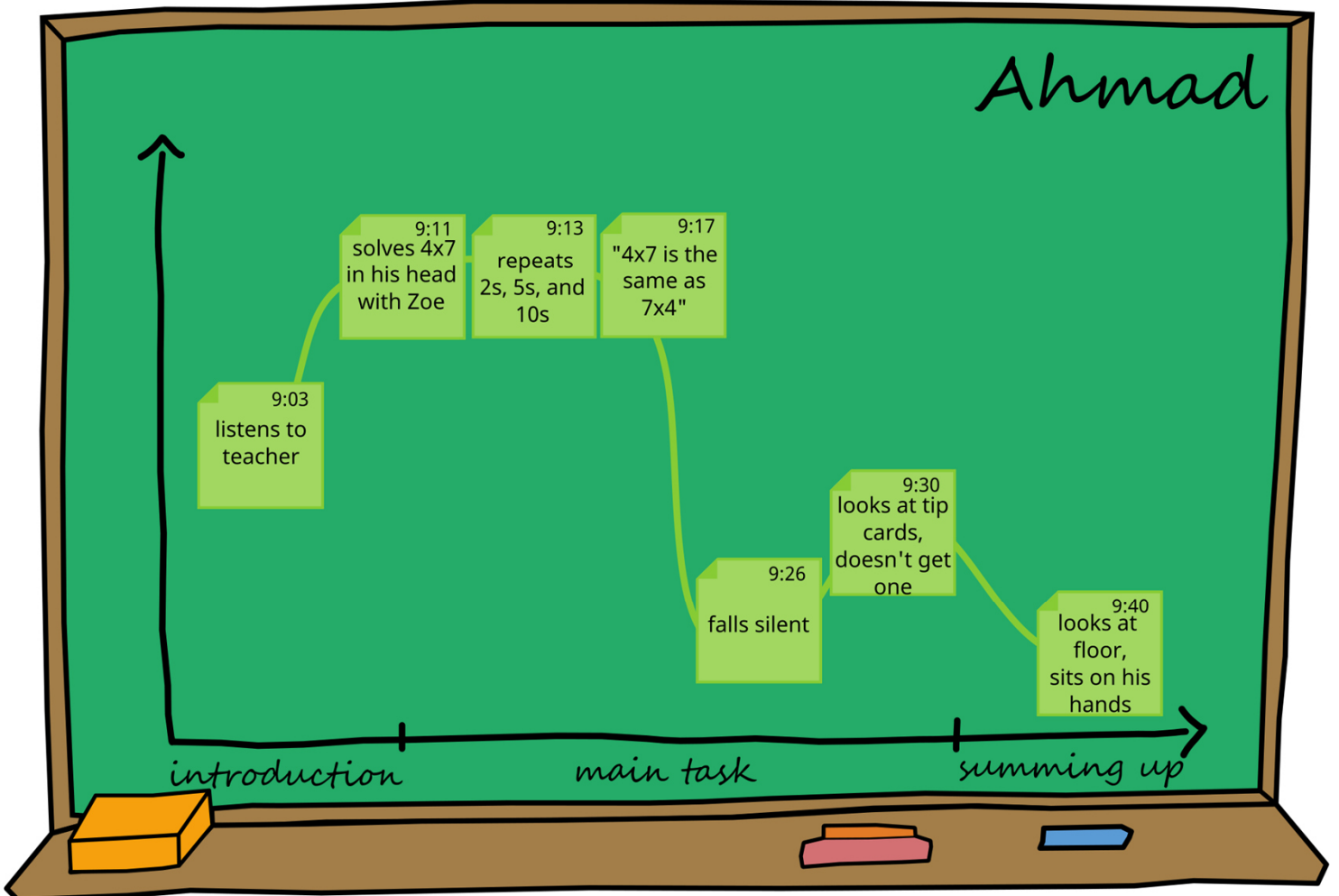




# learning activity curve



# learning activity curve





# learning activity curve

Emira





## Game Material

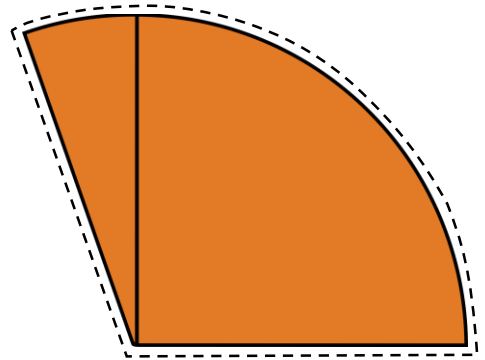
### Meeple

If you do not have a meeples at hand, you can build your own:

How it works:



1. Cut along the dotted line
2. Fold along the bold line
3. Glue together in the shape of a cone



### Victory Points

