Co-funded by the Erasmus+ Programme of the European Union

THE PAUL STREET BOYS THE BATTLE PLAN (T6)

S3 T6 D7 L1 P3

Focus on:

- Physics (D7)

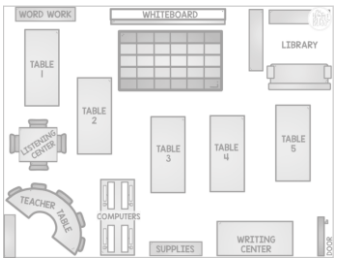
Task3: Draw a map of the classroom or the Grund! Make challenges to each other: get from one point to another!

Students create maps – making sure to measure the proportions and distances of objects
Every solution is good!
Any kind of tool and material can be used!
You can use the ideas and the list of materials from the Idea Bazaar, use your own ideas or just let the children to solve the problem using their creativity.

Idea Bazaar – some ideas:

- Students can make challenge cards (e.g. Get from the whiteboard to the teacher's table!) and play with them
- Students should give instructions to each other (Go ahead, Turn right, etc.)
- First move in the classroom for real, then just show the route you'd take on the map!

For details of the different solutions, see the Idea sheets!



Developmental fields:

In focus:
- Spatial orientation
- Computational thinking
- Attention

In addition:
- Subject concentration – Drawing, IT
- Creativity

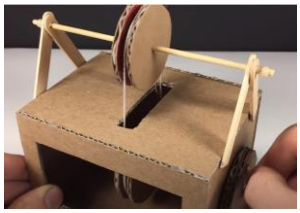
Task9: Create a catapult, a pulley, a lift, a screw, or other simple machines!

Students „learn by doing" about simple machines
Every solution is good!
Any kind of tool and material can be used!
You can use the ideas and the list of materials from the Idea Bazaar, use your own ideas or just let the children to solve the problem using their creativity.

Idea Bazaar – some ideas:

- Students should research simple machines and build some of them
- Recycled materials (eg. Tin cans, spatula, cardboard boxes, etc) can be used

For details of the different solutions, see the Idea sheets!



Developmental fields:

In focus:
- Subject concentration – Physics
- Fine motor skills
- Life skills

In addition:
- Creativity
- Talent development

How to manage output:

Hang the pictures on the wall, on a big poster, and ask the children to arrange them according to a rule they decide.
Store the objects in a wardrobe, to protect them from falls.
Attach a label with the name of the group!

RIDE

Co-funded by the Erasmus+ Programme of the European Union

THE PAUL STREET BOYS
THE BATTLE PLAN (T6)

S3 T6 D7 L2 P3

Focus on:
- Physics (D7)

Goals of the lesson:
- text comprehension
- problem solving
- decision making
- organizing group work

The Paul Street Boys were preparing for a battle for the Grund against the Redshirts.
Boka, their president, explained the battle plan to the boys.
„Divisions A and B (this is the army on the Paul Street side), upon seeing the Redshirts approach, will open the gate."
„Open it?"
„Yes, you'll open it. We won't hide from them because we want to give them battle.
So, as I say, you'll open the gate and let their troops enter. As soon as their last man steps in, you'll attack them. At the same time, fortresses 4, 5 and 6 will begin to bombard them. You'll make every effort to drive them out, if you fail in that, you will at least prevent them from breaking through the line formed by fortresses 3, 4, 5 and 6 and from remaining on the grund.
The other army, the one on Maria Street (Divisions C and D), will send a patrol into Maria Street. When the other army of redshirts emerges in that region, your divisions must line up ready for battle. After the redshirts have come through the big gate, both divisions will pretend to beat a hasty retreat. Here, look at the map... do you see my point? Division C will run into the wagon shed..."
„On the other hand, Division D will run into Janó's hut. The Redshirts will naturally run around both sides of the steam-saw. But behind the saw they'll come face to face with fortresses 1, 2 and 3. These will start bombardment at once.
The two divisions will emerge, one from the wagon shed, the other from the Slovakian's hut, and attack the enemy in the back. If you fight bravely, the enemy will be forced into a tight corner and will have to surrender. If they do not, you'll drive them into the shack and bolt the door on them.
After that's done, Divisions C and D will hasten to the aid of Divisions A and B. The troops of fortresses 1 and 2 will, at the same time, enter fortresses 4 and 5 in order to make the bombardment all the more intense. After that, Divisions A, B, C and D will form one solid line of attack that must force the enemy toward the Paul Street gate. And so we'll be bound to drive them out! Is that clear?"

Suggestions

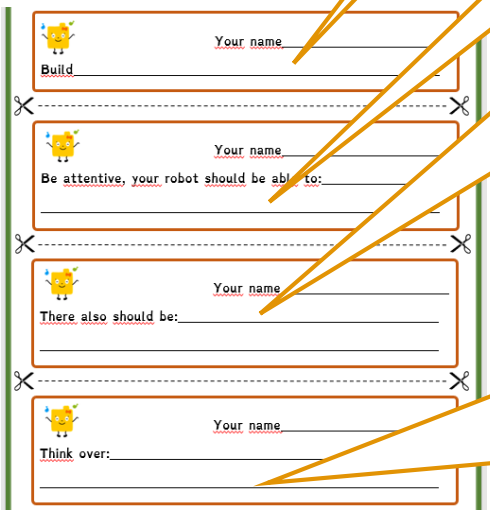
Understand the battle plan
- Build the model of the Grund according to the map in the text
- Understand the battle plan!
  - Students can use the Storyline template. They should draw the phases of the battle (position and activity of the troops)
  - Students can draw a flowchart of the battle. They should collect the episodes of the battle, their order in time and their connection to each other, the backup plans
- Build small figures and play out the battle

Why was this battle plan good?
- Discuss the aspects of planning an action (taking causes and effects as well as thoughts and actions of others into consideration, building on cooperation, etc.)
- Figure out alternative battle plans!

Suggested materials
- ArTeC robot and Blocks (at least the 112 pcs set)
- Cardboard, boxes, recycled materials, other building sets
- Color papers, pencils, sharpies

How to use the character card:
Each student fills in his/her own Character card:
- writes the name of the character
- their features, movements, reactions
- collects the elements of the environment, other accessories, things to be built
- thinks over the phases, tools and materials of the robot's building

Students can use more pieces of each part of the Character card if needed!



Troops A, B, C, D, E1..6
Catapult
Flag
Gate

Run
Fight
Bombard
Cage in
Throw

The Grund
Stacks of wood – maze
Buildings on the Grund
Paul Steet boys
Redshirt boys

The main actions of the story
Divide the text segment into pieces
Make a list about things needed
Media files needed

Co-funded by the Erasmus+ Programme of the European Union

THE PAUL STREET BOYS
THE BATTLE PLAN (T6)

S3
T6
D7
L3–4
P4

Suggested materials
- ArTeC Blocks (at least the 112 pcs set) and ArTeC robotics set (1, 2 or more Studuino motherboards, 2 DC motors, wheels, 2 servo motor, 1 Touch sensor, 1 IR Photoreflector, 2 LEDs, 1 Buzzer)
- Mindmap or Chart draft , Storyline
- Character cards and Robotic task card template
- Pencil

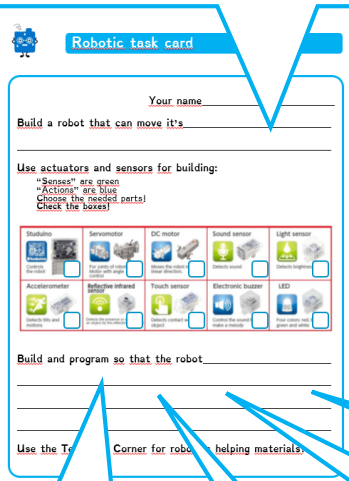
Focus on:
- Physics (D7)

Goals of the lesson:
- fine motor skills,
- problem solving,
- decision making
- life skills

How to fill in the Robotic card?
- Choose robot's „activity" and its programming complexity according to the Character task card, the developmental aim and the programming level that fits the child's skills.
- More Robotic cards can be filled in if needed (for clarification or for differentiation).

Suggestions
- Discuss how catapults work
- Discuss technical possibilities of raising a flag, have the students collect photos about the diferent solutions
- Discuss military trumpet signals, have the students collect audio files from the internet
- You can have the students build just parts of the battle scene
- OR
- The whole group can work together on this scene. Divide the students into groups and they should build and program robots for each of the troops and each phase of the battle. There could be troops moving along a line according to the battle plan, catapults, opening gates, flags, etc.

Catapult arm
Arm
Play signal


Robotic task card

Your name

Build a robot that can move it's

Use actuators and sensors for building:
"Senses" are green
"Actions" are blue
Choose the needed parts!
Check the boxes!

Studuino | Servomotor | DC motor | Sound sensor | Light sensor
Accelerometer | Reflective infrared sensor | Touch sensor | Electronic buzzer | LED

Build and program so that the robot

Use the T… Corner for robo… helping materials!

Related topics in the Technical corner
- Programming DC motor
  - Winding the motor a number of times (2.a, 2.b)
  - Winding the motor until the sensor detects change (4.b, 4.c)
- Programming servo motor
  - Repeated movement of the arm for a number of times (3.b)
- Testing and programming Touch sensor (4.a, 4.b, 4.c)
- Testing and programming IR Photoreflector (7.a)
  - Using an IR Photoreflector for detecting an object (7.e)
- Using LED (5.a)
  - Blinking (5.b)
- Using Buzzer (6.a, 6.b)

Modeling the Grund, minifigures, mechanical catapult

PROG1

Catapult controlled by a Touch sensor

PROG2

Catapult starting to work when the projectile is put into its bucket
A trumpeter, started by whistling or clapping, moves around on the Grund, blowing his trumpet

PROG3

Building the Grund with woodstacks, figures, catapult and trumpeter blowing his trumpet while moving around.

A flag rises on a pole.

PROG4

Co-funded by the Erasmus+ Programme of the European Union

THE PAUL STREET BOYS
THE BATTLE PLAN (T6)

S3 T6 D7 L3–4 P5

Ideas for robots on different programming levels

PROG1	PROG2	PROG3	PROG4
Modeling the Grund, minifigures, mechanical catapult	Catapult controlled by a Touch sensor	Catapult starting to work when the projectile is put into its bucket A trumpeter, started by whistling or clapping, moves around on the Grund, blowing his trumpet	Building the Grund with woodstacks, figures, catapult and trumpeter blowing his trumpet while moving around. A flag rises on a pole.

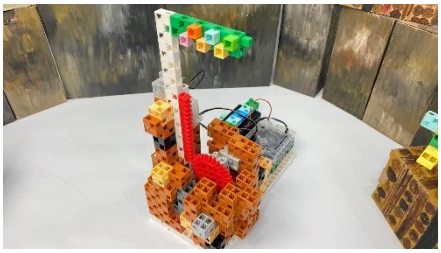
The battle on the Grund

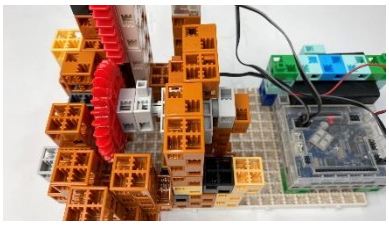
P1 Build The Grund with a mechanical catapult

- Build The Grund – woodstacks, little figures, buildings, gates, etc.
- Build a mechanical catapult turning on an axle.
- Affix the axle to various points of the launching arm, and see how far the projectile can be launched with each point.

P2 Build a controlled catapult

- The catapult should be moved by a servo motor
- It launches at the press of a Touch sensor
- A LED should flash while launching
- After launching, the arm should be moved back to the starting position automatically





P3 Build a load-controlled catapult and a trumpeter

- The catapult should be moved by a servo motor
- It should launch after a projectile is put into its bucket – an IR Photoreflector should detect it
- A LED should flash while launching
- After launching the arm should be moved back to the starting position automatically
- Build a robot car and add a trumpeter on top of it.
- The arm of the trumpeter is moved by a servo motor – it can lift up its hand holding the trumpet
- Moving around, he should blow his trumpet – playing a tune with the Buzzer
- The trumpeter should be started by whistling or clapping that is detected with a Sound sensor

P4 Playing out the battle

- Build all the objects and robots listed in P1-P3
- Build a flagpole with a flag
- The flag-raising mechanism can be built from a servo motor, a gear and a driverail
- The raising starts at the press of a Touch sensor