

# ALICE IN WONDERLAND

## ADVICE FROM A CATERPILLAR (T3)

S9  
T3  
D9  
L1 P3

### Focus on:

- Creativity, talent development (D9)



### Task1: Do you know what "to scale" is? Draw a giant Alice from a small grid!

Students draw a giant Alice from a small grid! They will have to calculate and then draw it.

#### 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:

- Using templates and grids
- Using colours and different sizes of grids.

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

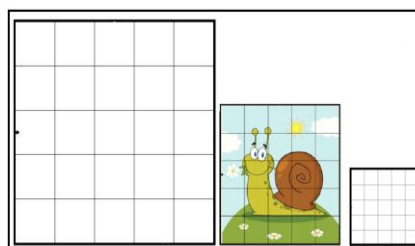
### Developmental fields:

#### In focus:

- Spatial orientation
- Computational thinking
- Attention

#### In addition:

- Subject concentration – Drawing, IT
- Creativity



### Task2: Create animation!

Students create an animated Flipbook with the characters from paper templates or they create it online! Or create a Thaumatrope out of templates. They will have to draw and cut their designs!

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### Idea Bazaar – some ideas:

- Creating an animated flipbook from templates with the characters.
- Creating an animated flipbook with the characters online using piskelapp.
- Using templates of Thaumatrope.
- Using colours and different materials to create a thaumatrope
- Make challenges with different designs and rotate them quickly!

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### Developmental fields:

#### In focus:

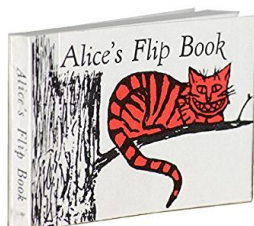
- Spatial Orientation
- Fine motor skills
- Creativity

#### In addition:

- Life skills
- Subject concentration – Drawing, IT
- Talent development

### How to manage output:

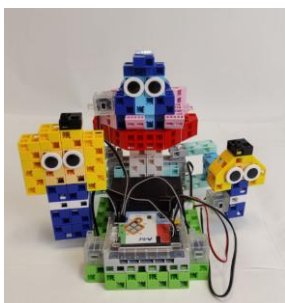
Store the objects in a wardrobe, to protect them from falls. Attach a label with the name of the group!



# ALICE IN WONDERLAND

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T3  
D9  
L2 P3



### Focus on:

- Creativity, talent development (D9)

### Goals of the lesson:

- text comprehension
- problem solving
- decision making
- organizing group work



The Caterpillar and Alice looked at each other for some time in silence before the Caterpillar took the hookah out of its mouth, and asked her: "Who are *you*?" Alice replied she didn't know because she has changed so many times that day and told him that she couldn't remember things as she used to, so the Caterpillar asked her to repeat 'You are old, Father William', which she repeated with a lot of mistakes.

Alice wanted to grow again, so the Caterpillar said: "One side of the mushroom will make you grow taller, and the other side shorter." Alice looked at the mushroom, trying to make out which were the two sides of it. However, at last Alice tried one part which made her shrink until her head hit her feet. Quickly she eats from the other part which makes her grow until her head and neck rise far above the treetops.

Because of her long neck, a pigeon mistakes her for a serpent in search of her eggs. Alice succeeds in convincing it that she is only a little girl and eats again from the mushroom until she is reduced to her normal size. She walked on and reached an open place in the woods with a little house in it. As she was too big to enter, she ate from the mushroom to bring herself back to the right size.

### Main features and interactions of the characters

| Character   | Features                             | Interactions                                     |
|-------------|--------------------------------------|--------------------------------------------------|
| Caterpillar | Walks, speaks, argues, hookahs       | Argues with Small Alice<br>Argues with Big Alice |
| Small Alice | Hides, Appears, Talks, Eats mushroom | Hides and appears<br>Argues with Caterpillar     |
| Big Alice   | Hides, Appears, Talks, Eats mushroom | Hides and appears<br>Argues with Caterpillar     |

### 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, etc.
- collects the elements of the environment, other accessories, things to be built
- thinks over the phases, tools and materials of the robot's building

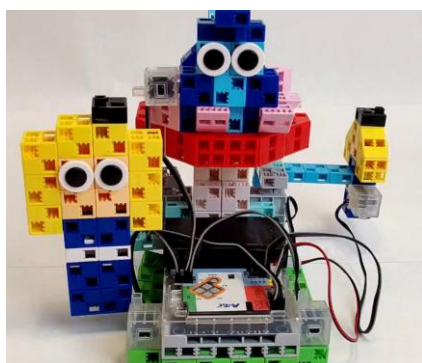
**Students can use more pieces of each part of the Character card if needed!**

Caterpillar, Big Alice, Small Alice

Hide  
Appear  
Talk  
Discuss  
Walk

Mushroom  
hookah

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




 Your name \_\_\_\_\_  
 Build \_\_\_\_\_


 Your name \_\_\_\_\_  
 Be attentive, your robot should be able to: \_\_\_\_\_


 Your name \_\_\_\_\_  
 There also should be: \_\_\_\_\_


 Your name \_\_\_\_\_  
 Think over: \_\_\_\_\_

# ALICE IN WONDERLAND ADVICE FROM A CATERPILLAR (T3)

S9  
T3  
D9  
L3-L4  
P4

## Suggested materials

- ArTeC Blocks (at least the 112 pcs set) and ArTeC robotics set (1 Studuino motherboards, 1 DC motor, 4 servo motors, 2 IR Photorelector, 2 Touch sensors, 1 LED, 1 Buzzer)
- Mindmap or Chart draft , Storyline
- Character cards and Robotic task card template
- Pencil

## Focus on:

- Creativity, talent development (D9)

## 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

- Raise discussions about whether to follow a stranger's advice.
- Why are there good advices and bad advices?
- Discuss methods of shrinking things and of making things grow.
- Build simple figures from ArTeC Blocks.

Big Alice  
Small Alice  
Caterpillar

**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 |  Infrared sensor |  Touch sensor |  Electronic buzzer |  LED          |

Build and program so that the robot \_\_\_\_\_

Use the \_\_\_\_\_ Corner for robotics helping materials!

## Related topics in the Technical corner

- Programming DC motor
  - Setting power, direction(2.a, 2.b)
  - Random movements (2.f)
- Programming servo motor (3.a, 3.b, 3.c)
- LED (5.a, 5.b)
- Buzzer (6.a, 6.b)
- IR Photorelector (7.a, 7.b, 7.d, 7.e)
- Using variables (11.a, 11.b, 11.c)

Big Alice and Small Alice hiding and appearing

PROG1

Both Alices hide, then Small Alice or big Alice appears or disappears on Pushing the Touch sensor

PROG2

The Caterpillar turns randomly to the right or left.  
This determines which size Alice is brought forward..

PROG3

At the same time as Alice, a small or large part of the mushroom cap will fall off. The Caterpillar also tilts in the right direction.

PROG4

# ALICE IN WONDERLAND ADVICE FROM A CATERPILLAR (T3)

S9  
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L3-L4  
P5

## Ideas for robots on different programming levels

Big Alice and Small Alice hiding and appearing

PROG1

Both Alices hide, then Small Alice or big Alice appears or disappears on Pushing the Touch sensor

PROG2

The Caterpillar turns randomly to the right or left. This determines which size Alice is brought forward.

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PROG4



## The Caterpillar

### P1 Alice changes size

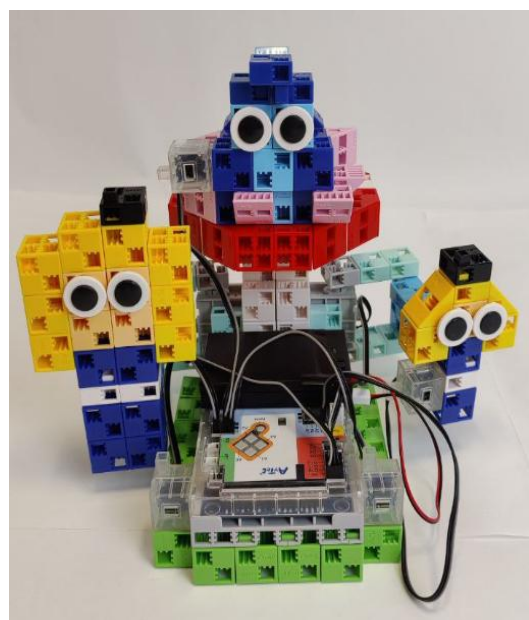
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- Build the Mushroom, the Caterpillar, the Little and the Big Alice
- The Caterpillar rotates on an axle on the cap of the mushroom.
- a.) Build a mechanical construction
  - Under the cap of the mushroom, the two Alices of different sizes can be moved forwards or backwards by means of an axial mechanism.
  - Wherever the Caterpillar turns, the Alice is propelled forward.
- b.) Build a programmable structure: using 1 basemount and 1 DC motor.
  - On the mushroom stalk, 1 DC motor moves the Alices, so that the smaller or the larger Alice are moved forward.
  - The robot's program starts automatically.

### P2 Alice changes size with control

- P2
- Build the mushroom, the Caterpillar, the small and the big Alice, as in P1
- The two differently sized Alice figures are mounted on the stalk of the mushroom, jointed to 1-1 Servo motor on each side.
- At the beginning, both Big and Small Alice will be at the back, pretending to be hiding.
- The two figures are controlled and moved forward and backward by 1-1 Touch sensor.
- The change of size is indicated by the flashing of 1 white LED.
- The Caterpillar can be rotated on the axis in the direction of the Alice moved forwards.

### P3 Alice, the Caterpillar and the Dove

- Build the mushroom and Alice figures as in P2 (2 servo motors, 2 Touch sensors)
- 1 servo motor is built into the mushroom cap, it rotates the Caterpillar on top of the cap.
- Mount an IR Photorelector on the front of the robot. If it detects the presence of the Pigeon, the Caterpillar will randomly rotate to the right or left on top of the mushroom.
- The LED mounted on the Caterpillar flashes after the turn and after the turn back.
- Wherever the Caterpillar is turned, pressing the Touch sensor associated with that Alice will move the Alice figure of that size forward and then back.



### • P4 Expanding mushroom

- The two Alice figures are mounted on both sides of the mushroom stalk with 1-1 servo motor, similar to P3.
- The mushroom cap is also fitted with 1-1 Servo motor, moving two differently sized cap pieces.
- The Caterpillar is wedged between the two downward cap pieces to allow it to tilt freely to the right or left.
- When the Pigeon is placed in front of one of the 2 IR Photorelectors placed in front of the Mushroom, the Servo motor moves the Alice associated with that side back and forth, while the cap piece associated with that side tilts, also using a Servo motor.
- The Caterpillar then always tilts in the direction in which the hat is bent. When the robot returns to its home position, the Buzzer will sound.



# ALICE IN WONDERLAND

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S9  
T3  
D10  
L1 P3

### Focus on:

- Creativity (D10)



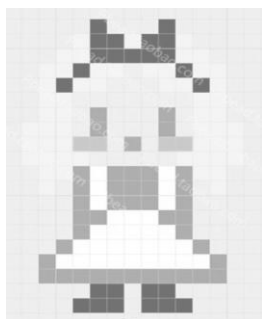
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Students draw a giant Alice from a small grid !They will have to calculate and then draw it.

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#### Idea Bazaar – some ideas:

- Using templates and grids
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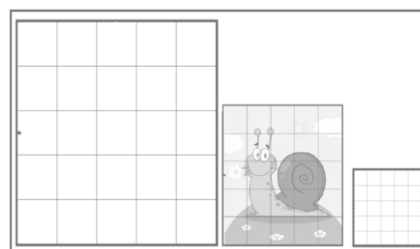
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##### In focus:

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- Attention

##### In addition:

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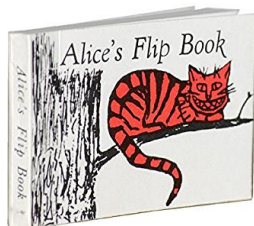
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- Make challenges with different designs and rotate them quickly!

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#### How to manage output:

Store the objects in a wardrobe, to protect them from falls. Attach a label with the name of the group!



#### Developmental fields:

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- Spatial Orientation
- Fine motor skills
- Creativity

##### In addition:

- Life skills
- Subject concentration – Drawing, IT
- Talent development

# ALICE IN WONDERLAND ADVICE FROM A CATERPILLAR (T3)

S9  
 T3  
 D10  
 L1 P4

## Focus on:

- Creativity (D10)



### Task3: How does the characters and the scenes of the story look like?!

Students create the characters of the story or the elements of the landscape.

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Any kind of tool and material can be used!

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#### Idea Bazaar – some ideas:

- Building environment out of ArTeC Blocks
- Building environment out of recycled materials
- Drawing
- Creating computer graphics

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

#### Developmental fields:

##### In focus:

- Spatial orientation
- Fine motor skills
- Creativity

##### In addition:

- Attention concentration
- Subject concentration – Drawing, IT
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### Task4: Play with marbles!

Students plan and build their own marble run course or maze.

They create their own set of rules and play with it together or teach the rules to their classmates and organize a championship.

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#### Idea Bazaar – some ideas:

- Building a marble run out of ArTeC Blocks
- Building a marble run out of recycled materials
- Building a maze out of cardboard, straws, pencils, recycled materials, etc.
- Steering marbles together by tilting a huge maze

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

#### Developmental fields:

##### In focus:

- Spatial orientation
- Fine motor skills
- Social competencies

##### In addition:

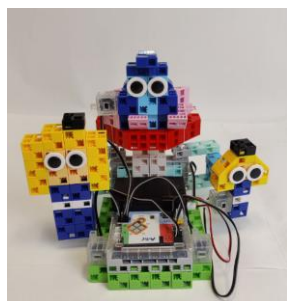
- Attention concentration
- Subject concentration – Physics



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T3  
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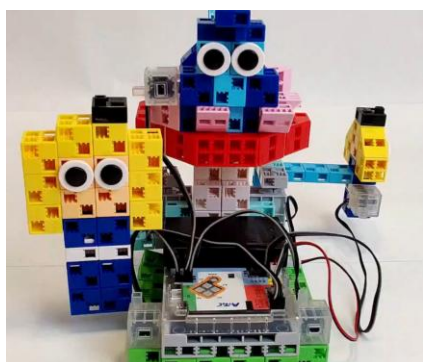
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 Build \_\_\_\_\_


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 There also should be: \_\_\_\_\_


 Your name \_\_\_\_\_  
 Think over: \_\_\_\_\_



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### 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

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Big Alice  
Small Alice  
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### Related topics in the Technical corner

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- IR Photoreflector (7.a, 7.b, 7.d, 7.e)
- Using variables (11.a, 11.b, 11.c)

The name of my robot: \_\_\_\_\_

The parts I need for my robot:

|       |             |          |     |        |                   |              |
|-------|-------------|----------|-----|--------|-------------------|--------------|
| Motor | Servo motor | DC motor | LED | Buzzer | IR Photoreflector | Touch sensor |
|-------|-------------|----------|-----|--------|-------------------|--------------|

Choose the parts you need! Check the robot you use!  
 Alice: action  
 Gracie: setting  
 Find robotics supports materials in the Technical Corner!

This is how I build and program my robot:

| When to I start | What is a doing | When I start | What I do | When I start | What I do | When I start | What I do |
|-----------------|-----------------|--------------|-----------|--------------|-----------|--------------|-----------|
|                 |                 |              |           |              |           |              |           |
|                 |                 |              |           |              |           |              |           |
|                 |                 |              |           |              |           |              |           |
|                 |                 |              |           |              |           |              |           |
|                 |                 |              |           |              |           |              |           |

This is how my robot will work: Write it in complete sentences using the table above!

|  |
|--|
|  |
|  |
|  |
|  |
|  |

Big Alice and Small Alice hiding and appearing

PROG1

Both Alices hide, then Small Alice or big Alice appears or disappears on Pushing the Touch sensor

PROG2

The Caterpillar turns randomly to the right or left.  
This determines which size Alice is brought forward..

PROG3

At the same time as Alice, a small or large part of the mushroom cap will fall off. The Caterpillar also tilts in the right direction.

PROG4



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## The Caterpillar

### P1 Alice changes size

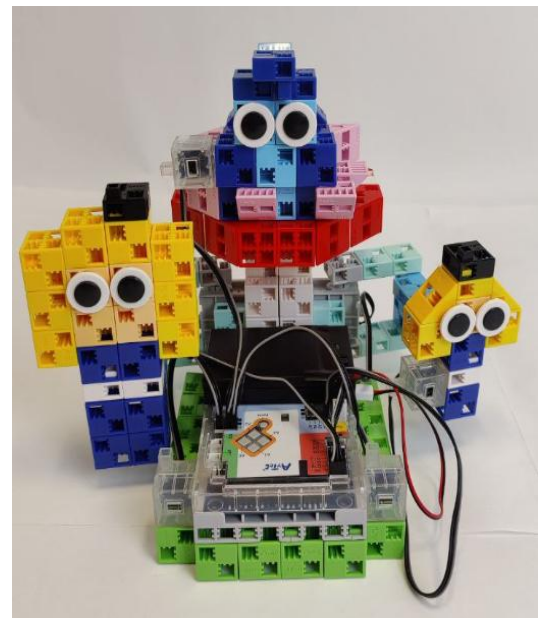
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  - Under the cap of the mushroom, the two Alices of different sizes can be moved forwards or backwards by means of an axial mechanism.
  - Wherever the Caterpillar turns, the Alice is propelled forward.
- b.) Build a programmable structure: using 1 basemount and 1 DC motor.
  - On the mushroom stalk, 1 DC motor moves the Alices, so that the smaller or the larger Alice are moved forward.
  - The robot's program starts automatically.

### P2 Alice changes size with control

- P2
- Build the mushroom, the Caterpillar, the small and the big Alice, as in P1
- The two differently sized Alice figures are mounted on the stalk of the mushroom, jointed to 1-1 Servo motor on each side.
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- The two figures are controlled and moved forward and backward by 1-1 Touch sensor.
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### P3 Alice, the Caterpillar and the Dove

- Build the mushroom and Alice figures as in P2 (2 servo motors, 2 Touch sensors)
- 1 servo motor is built into the mushroom cap, it rotates the Caterpillar on top of the cap.
- Mount an IR Photorelector on the front of the robot. If it detects the presence of the Pigeon, the Caterpillar will randomly rotate to the right or left on top of the mushroom.
- The LED mounted on the Caterpillar flashes after the turn and after the turn back.
- Wherever the Caterpillar is turned, pressing the Touch sensor associated with that Alice will move the Alice figure of that size forward and then back.



### P4 Expanding mushroom

- The two Alice figures are mounted on both sides of the mushroom stalk with 1-1 servo motor, similar to P3.
- The mushroom cap is also fitted with 1-1 Servo motor, moving two differently sized cap pieces.
- The Caterpillar is wedged between the two downward cap pieces to allow it to tilt freely to the right or left.
- When the Pigeon is placed in front of one of the 2 IR Photorelectors placed in front of the Mushroom, the Servo motor moves the Alice associated with that side back and forth, while the cap piece associated with that side tilts, also using a Servo motor.
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