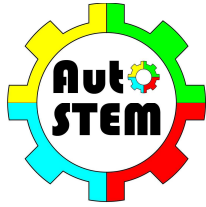


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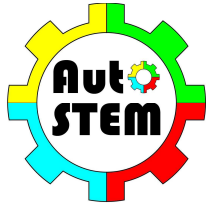
AutoSTEM lesson plan example 5

<i>Title of your project lesson</i>	Dance of human qualities through the making of dancing dolls
<i>The Children</i> • Age	9 years (3 rd grade)
<i>Learning Objectives</i>	<ul style="list-style-type: none"> • Introduction to the concepts of energy and work • Formation of knowledge for the energy transfer from the manual rotation of the handle in the movement of the doll • Development of engineering competencies for analysis and construction • Assimilation of mathematical concepts • Formation of new knowledge about the parts of the human body • Development of interdisciplinary connections of fine arts with mathematics, literature and nature • Development of creative abilities • Speech development through demonstration and dramatisation
<i>Automata to be constructed</i>	The Dancing Doll
<i>Resources</i>	Coloured paper, scissors, cardboard, cardboard boxes, pencils, felt-tip pens, wooden skewers, cone template, mechanism box, long wooden sticks, drinking straws, glue stick or hot glue gun
<i>Cross-curricular links</i>	Mathematics, natural science, art, writing
<i>STEM content</i>	Keyword content: mechanism, energy, drive, friction



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<p><i>The script</i></p> <p><i>Expected project results</i></p>	<p>The scenario is described in the course of the lesson.</p> <ul style="list-style-type: none"> • acquiring new knowledge about our environment • consolidation of already acquired knowledge • formation of new skills for making the given product • writing stories about dancing dolls • dramatisation and inventing scenes with them • science
<p><i>Activity description, plan</i></p>	<ol style="list-style-type: none"> 1. Observation of dancing dolls: <ol style="list-style-type: none"> a. Videos of already made ones are shown https://youtu.be/_1tldldgBPo 2. Research, analysis and discussion: <ol style="list-style-type: none"> a. Here the children have to tell what impressed them, b. how they think these dolls are moving, c. what they can and cannot explain. d. Here they ask their questions accordingly 3. Explanation <ol style="list-style-type: none"> a. Here I explain what the stages of construction of the doll are 4. Teamwork 5. Making dolls <ol style="list-style-type: none"> a. Each team must make a doll that corresponds to certain human quality. This can be set as a task, or we can talk beforehand about human qualities. 6. Demonstration of the made dolls and dramatisation with them
<p><i>Criteria for assessment and self-assessment</i></p>	<ol style="list-style-type: none"> 1. Criteria for analysis of the results <ol style="list-style-type: none"> a. Creativity and innovation b. Critical thinking and problem solving c. Their application in our lives d. Knowledge of the content 2. Assessment and self-assessment <ol style="list-style-type: none"> a. Teacher assessment b. Team evaluation for other teams c. Self-assessment



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The course of the lesson:

The lesson is of an integrated type. It is about making a dancing doll in a drawing and composition class according to a given model and speech development.

Preparatory stage:

Students are divided into teams. Before the way of making dancing dolls with the children is shown, a discussion about the human qualities is held. I divide them into groups as each team draws one card of appropriate quality. I explain to them that the way the doll is made is the same, but the type of doll itself will be different depending on the human quality that the team has drawn.

They are divided into four teams corresponding to the four qualities: laziness, diligence, self-confidence and insecurity. Each team must play with pantomime in front of the others, the given quality, and the others try to guess it. Then each group must think about what colours and additional materials a doll should have to represent the given quality. The teams must also invent a necklace with a symbol of this quality. It can be painted or made of waste materials that will remain after manufacturing the main product.

The teacher has set the same preconditions for everyone, but everyone must think about the specific quality. Each team gets the beginning of an essay: "Once upon a time, there was a magical kingdom. It was ruled by the queen of Hardworking/Laziness/Confidence/etc. One day the Good Wizard came there and invited her to go to the ball of Truth. She had to choose how to dress to look the most beautiful because the most handsome princes will come there to choose their dance partner. She was dressed in [list the colour and appearance of her clothes]. Her eyes were ... Her hair was ... She had ... hands, etc." Here every team describes how they imagine her clothes and appearance and the corresponding quality. Then they make the doll.

Once they start making the queen doll, the children have to think about how they will finish the composition and play it. This will be discussed while making the doll.

Observation:

The children watch how the doll is made from the respective video. I show more like this:

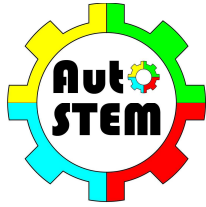
https://youtu.be/_1tldldgBPo

The teacher plays the video without interruption. There is a discussion about what they have memorised, what they think is easy and what is challenging to make. Accordingly, he asks the question of which of the given queens this doll displays. If she does not look like them, how would they change her to look like them? Each team talks about their doll, with the other groups complementing each other. The queen of laziness, for example, can have very long and tousled hair, dirty clothes, etc.

Study of physics and mechanisms

The children comment on the movements of the dolls. They get acquainted with the necessary materials for the production. They comment on what materials they are made of, whether they are solid, liquid or gaseous bodies, what properties they are familiar with from the lessons on man and nature, etc. The teacher

- complements their knowledge and tells them more about the properties of these materials, etc.;
- explains to the students what friction is and how it transfers power from one wheel to another;



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- shows a model of a doll and how the edge of the round disk is rubbed on the surface of the other disk.

Designing the doll:

The teacher introduces the geometrical shape “cone”. The children discuss the different shapes of the doll, its parts and their location. We recall the studied geometric shapes and decide which part of the body matches which shape. First, we work on the template, and then I give the children freedom for the size, colour and shape of the figures. With the next doll, the pattern can be reduced or enlarged according to preferences, the set topic for speech development, etc. The goal is for children to have freedom of choice and to learn to think independently.

Speaking of the parts of the human body, we remember how they are called in English, and at some point, I set the task for the children to continue the conversation in English by asking questions about the shape, size, and colour of the dolls. At this time, we glue the parts of it to the given pattern.

Gradually we start to construct the dolls:

-  we cut out the figures and make a cone around the skewer
-  we glue the skewer
-  we make a head out of the circle
-  we take the boxes to make the mechanism.
-  mark the centre at both ends of the box
-  make holes in the centre and put two diagonal lines
-  we take two caps from gear bottles
-  after making a hole in one gear, we pass a skewer through the gear
-  pass a skewer through both sides of the box
-  we make a hole in the top of the box for the straw to enter
-  we stick a 5 cm piece of straw through the hole we made in the upper part of the box
-  press the second skewer with the doll through the straw and add the second gear to its bottom.
-  we can add a handle at the end of the horizontal rod using a bottle cap

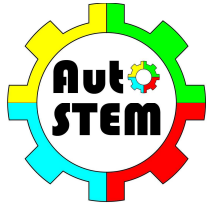
Additional decorations and elements of the dolls. Assessment and self-assessment.

Here I give the teams the complete freedom to complete the dolls, draw something on the boxes, make a necklace for them, etc., and everything to be related to the respective quality that the doll will present. After the main part of the construction and production has passed, the students read their essays according to the given beginning while doing other things. The other teams listen and provide their assessment. Everyone votes for the other teams except their own. We discuss other positive and negative qualities and what kind of doll we would imagine them to be. Everyone shares whether it was easy for him or her to make the doll and whether it was easy to have the appropriate quality, etc.

Demonstration and puppet theatre

Each team shows their doll and their scene, which is invented due to the composition at a given beginning. Everyone participates, and then they exchange roles. All dolls go through the individual teams, and everyone tries to play the given qualities.

I also set as an additional task to develop a common scene with all the dolls and qualities. I do not set a deadline for completion of the task to check how motivated the students are.



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Playing with dolls

Initially, I leave the children to invent their own games with the dancing dolls and have fun. They can also sing favourite songs with them or try to invent their own song. I play them learned songs in English, and they sing and dance with the dolls. In the songs about the human body in AE, each team points to the dolls' respective body parts as they sing.

Teacher assessment and additional tasks

All students receive positive feedback and a lot of praise. I greet them with a favourite children's song.

I take pictures of the respective teams' dolls, take pictures of them together with the teams, and then make a joint video of the class.

Additional task:

Everyone has to write an essay on the given beginning at home, without giving them a deadline. My goal is to see how motivated the students are, etc.

They should try to make their own comic book on the composition according to a given beginning and draw, not to make the appropriate doll. They do not have to write about the quality they have received. It may be another quality that did not participate in the previous tasks. Besides, they have to paint two castles, one of which is the castle of negative attributes and the other of positive qualities.

Optional task:

The children write in their logbook what they have learned and how they felt while making the dolls.