2014 Student Program Lesson Plan

For step-by-step help in completing this document, please see the accompanying guide

Date:	Jule 28, 2014	Class:	LEGO Robotics & Astronomy Project. Lesson 4 "The main ideas of robotic software"

Definition and Guiding Question

LESSON	LEARNING EPISODE
For the purpose of this STARTALK template a *lesson* is defined as a single learning experience lasting no more than ninety minutes. Learning experiences occur both in the classroom and/or in other settings. Longer blocks of time will involve several learning episodes and lesson plans.	For the purpose of this STARTALK template a *learning episode* is defined as a learning experience that addresses a specific aspect of a learning target or can-do statement. Learning episodes typically provide a limited amount of input with time allowed for guided and independent practice. The amount of time allotted for a learning episode is approximately equivalent to the age of the learner and will rarely be more than twenty minutes.

Questions to Consider Before and During Lesson Planning

Do the activities in the lesson

- provide sufficient opportunities for understanding new words <u>before</u> expecting production?

- provide multiple, varied opportunities for students to hear new words/expressions used in highly visualized contexts that make meaning transparent?

- provide students with an authentic purpose for using words and phrases?

- engage <u>all</u> students (as opposed to just one or two students at a time)?

- give students a reason for needing to/wanting to pay attention and be on task?

- vary in the level of intensity and the amount of physical movement required?

- take an appropriate amount of time considering the age of the learner?

STAGE 1: What will learners be able to do with what they know by the end of this lesson?

DO	KNOW
What are the learning targets for this lesson?	*What vocabulary, grammatical structures, language chunks, cultural knowledge, and content information do learners need to accomplish the lesson can-do?*
Interpretive Reading The students can get factual information about programming options and alhorithms from articles and teacher's presentation. The students can exchange gotten information with peers during discussion **Adv.M.**	The students work in groups in the computer labs. The students ask and answer each other's questions about Astronomy&Engineering topics and create a robotic program as a result of discussion. *The main stage of program creation*: поставить задачу, определить условия деятельности объекта, определить начальные и конечные условия, составить схему решения; *Terms related to Computer Science*: цикл, если…то…, пока… делай…, повторить, переменная, константа, связи, блок, подпрограмма, язык программирования, отладка, скачать, запустить, окно, проект.
Interpersonal Communication The students can get information and express their own ideas and opinions when engaged in lengthy conversation related to the research project topic. **Adv.L.**	The students can listen, understand teacher's presentation and answer questions and state their opinion after presentation Lexical and morpho-syntactic means to say 'think/consider/believe/it seems to me/ from my point of view/from the perspective of': *я думаю, полагаю, считаю; мне кажется, с моей точки зрения;* Terms related to STEM topics*:* *Computer Science:* составление алгоритмов, написание программы, язык программирования, программные блоки, управление объектом; *Robotics:* базовая модель, сенсоры, основные оси, колеса, шасси, блоки управления, сенсоры движения, большой и малый моторы, кабели, повернуть налево, повернуть направо; *Physics:* уравнение движения, скорость, расстояние, движение вперед, назад, остановка.

Interpretive Listening	The students solve Math and Computer Sciense problems and exchange their findings during STEM lessons and astronomy research project.
The students can ask, follow, and give directions in process of coding robotics programm and in some complicated situations during Math problem solving **Int. H.**	*Math terms*: длина окружности, радиус колеса, пройденное расстояние, угол поворота, число, значение, отношение, уравнение, множество, переменная, функция, радиус, диаметр, длина окружности; *Understanding the structure of a Math problem genre* ("body"-narration and a question): Определите расстояние; нанесите полученные данные на график, найдите отношение (наклон, угол), постройте график зависимости скорости от времени,составте таблицу данных для нескольких испытаний, найдите среднее значение

STAGE 2: How will learners demonstrate what they can do with what they know by the end of the lesson?

What will learners do (learning tasks/activities/formative assessments) to demonstrate they can meet the lesson can-do?

The students learn the basics of algoritmic programming: coding, algoritm creation. The students learn different types of alhorithms through specific problem solving.

The students do LEGO robotics research. The students develop programming skills focusing on manipulating the EV3 software and learn simple programming tasks, such as forward, backward, and turning robot movements.

STAGE 3: What will prepare learners to demonstrate what they can do with what they know?

How will you facilitate the learning?

What activities will be used to ensure learners accomplish the lesson can do? What will the teacher be doing? What will the students be doing?

Opening Activity

The teacher sets the main goal of the lesson for the students by brief discussion "What is an alhorithm?"	Time: 10 min

Learning Episode

The students listen, watch and understand teacher's presentation about the different types of alhorithms. The students use information from presentation to make an examples of alhorithmic behavior in evereday life.	Time: 20 min

Learning Episode

The students learn to work with special LEGO EV3 educational software for understanding its basic tools and functions.	Time: 20 min

Learning Episode

The students learn to solve the simple programming tasks such as forward, backward, and turning robot movements.	Time: 30 min

Materials needed for this lesson

- PowerPoint Presentation about the basic of alhorithm creating
- LEGO EV3 educational software
- LEGO EV3 educational kit

Reflection/Notes to Self