2014 Student Program Lesson Plan Template

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

Date:	**July 30, 2014**	**Class:**	LEGO-Robotics & Astronomy Project. Lesson 6 "Studing of EV3 software for LEGO rover control"

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 before 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 all 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?
- make the learner, not the teacher, the active participant?

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

DO *What are the learning targets for this lesson?*	**KNOW** *What vocabulary, grammatical structures, language chunks, cultural knowledge, and content information do learners need to accomplish the lesson can-do?*
Interpretive Listening The students can understand teacher's presentation with some unexpected details on topics related to Engineering&Math&Astronomy**. Int. H.**	Terms related to Astronomy, Math: *Astronomy terms*: планета, разреженная/плотная атмосфера, поверхность, выйти на расчетную орбиту, пролетная траектория, оборот, сутки, год, спускаемый аппарат, зонд; *Engineering terms*: приборы, сенсоры, манипуляторы, камеры, корпус, бортовой компьютер, панели управления, средства связи; *Math terms*: расстояние, формула, длина окружности, эллипс, фокус, эксцентриситет.
Interpretive Listening The students can ask for, follow, and give directions in process of coding robotics program and in some complicated situations during math problem solving **Int. H.**	The students solve math and computer science problem and exchange their findings during astronomy research project. *Math terms*: длина окружности, радиус колеса, пройденное расстояние, угол поворот, число, значение, отношение, уравнение, множество, переменная, функция, радиус, диаметр, длина окружности; *Engineering terms*: устройство, управление, зарядка, технические характеристики, меню управления, сенсоры, мотор, соединительный кабель, детали, шестеренки; *Terms related to Computer Science*: цикл, если…то…, пока… делай…, повторить, переменная, константа, связи, блок, подпрограмма, язык программирования, отладка, скачать, запустить, окно, проект. *Understanding the structure of a math problem genre* ("body"-narration and a question): Определите расстояние; нанесите полученные данные на график, найдите отношение (наклон, угол), построить

	график зависимости скорости от времени,заполните таблицу данных для нескольких испытаний, найдите среднее значение.
Interpersonal Communication The students can exchange with peers detailed information related to engineering and astronomy fields during oral communication **Int. H.**	The main parts of robot: корпус, шасси, манипуляторы, сенсоры, приборы, панели, средства связи, кабель, камеры, компьютер, пульт управления; *The Math terms*: расстояние, диаметр колеса, расстояние, формула длины окружности, радиус окружности, количество оборотов колеса, угол поворота *The Astronomy terms*: космические исследования, уравнение движения, орбита, тестовые испытания, приборы и инструменты, спектрометр, солнечная панель, Земля, Марс, спутник, посадочный аппарат, марсоход

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 understand the main ideas of using robots for space explorations. LEGO robotics research: The students study the basics of LEGO robot programming using EV3 software. The students exploring such programming tools as loop and switch.

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 goals of the lesson for the students by briefly discussing the main pathways of using robots in space explorations*"*	Time: 10 min

Learning Episode

The students read and understand articles about the history of space exploration by robots. The students works in groups, find the necessary information and discuss the design and building the best Martian rover	Time: 10 min

Learning Episode

The students design the LEGO-rover which can solve the main goals of project	Time: 20 min

Learning Episode

The students studing write code on manipulating the EV3 software: continue studing the simple programming options such as loop and switch	Time: 40 min

Materials needed for this lesson

- PowerPoint Presentation about the main stages of Mars exploration by robots and satellites
- LEGO EV3 educational software
- LEGO EV3 educational kit

Reflection/Notes to Self