



# 2014 Student Program Lesson Plan Template

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

<b>Date:</b>	July 29, 2014	<b>Class:</b>	Evolution of stars
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## Definition and Guiding Question

LESSON	LEARNING EPISODE
For the purpose of this STARTALK template a <i>lesson</i> 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 <i>learning episode</i> 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 <i>What are the learning targets for this lesson?</i>	KNOW <i>What vocabulary, grammatical structures, language chunks, cultural knowledge, and content information do learners need to accomplish the lesson can-do?</i>
<b>Interpretive Listening</b> The students can understand teacher's presentation with some unexpected details on topics related to physics and astronomy. <b>Int. H.</b>	Terms related to Astronomy, Physics, Chemistry: Physics terms: <i>сила тяжести, ядерные реакции, сгорание, световое давление, расширение, сжатие, масса, спектр</i> ; Astronomy terms: <i>звезда, атмосфера, динамические характеристики, траектория, спектральный класс, светимость, гигант, карлик, эволюция</i> ; Chemistry terms: <i>кислород, водород, тяжелые элементы</i> .
The students can understand the main idea and most details on topics related to physics and astronomy presented through documentary films. <b>Adv.L.</b>	Terms related to Astronomy, Physics, Chemistry: Physics terms: <i>сила тяжести, ядерные реакции, сгорание, световое давление, расширение, сжатие, масса, спектр</i> ; Astronomy terms: <i>звезда, атмосфера, динамические характеристики, траектория, спектральный класс, светимость, гигант, карлик, эволюция</i> ; Chemistry terms: <i>кислород, водород, тяжелые элементы</i> .
<b>Interpersonal Communication</b> The students can exchange detailed information related to astronomical fields during oral communication with peers <b>Adv.M.</b>	The main stages of star evolution: <i>гигант, карлик, звезда, черная дыра, нейтронная звезда, спектральный класс, взрыв, оболочка звезды</i> ; The main physical characteristics of a star: <i>масса, светимость, возраст, спектральный класс</i> .
<b>Presentational Speaking</b> The students can make a brief presentation about evolution of a star in a formal style. <b>Int. H.</b>	Logical structure of an academic style presentation: introduction, body, and conclusion; Academic style conjunctions: <i>во-первых, во-вторых, далее, итак, таким образом, следовательно, подводя итоги, делая выводы, как уже было сказано</i> ;

	<p>Academic style lexical resources and grammar forms;</p> <p><i>Terms related to Astronomy: эволюция звезды, Солнце, красный гигант, протозвезда, белый карлик, планетарная туманность, главная последовательность, время жизни, черная дыра, нейтронная звезда.</i></p>
<p><b>Presentation Writing</b></p> <p>The students can write brief notes creating a poster about different patterns of star evolution <b>Int. H.</b></p>	<p><i>Terms related to Astronomy: эволюция звезды, Солнце, красный гигант, протозвезда, белый карлик, планетарная туманность, главная последовательность, время жизни, черная дыра, нейтронная звезда.</i></p>

## 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 listen to, understand, and answer the questions in oral and written form on Astronomy and Physics topics. The students work with database and try to redevelop the main theory of star evolution called Hertzsprung–Russell diagram. The students write brief essays about evolution of a selected star using the created theory.

## 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 a brief discussion about star family composition, their life cycle and physical structure.

Time: 5 min

## Learning Episode

The students watch, listen and understand teacher's presentation about star physics and star characteristics.

Time: 10 min

## Learning Episode

The students get a chart with main characteristics of a star and pictures of stars. The students place their pictures of stars according to the data provided on the coordinate plane on the class board. Together students rediscover a theory of star evolution called Hertzsprung–Russell diagram.

Time: 15 min

## Learning Episode

The students watch a documentary film “Evolution of the stars” for the purpose to find out the main idea and the most important details about the different types of star evolution.

Time: 12 min

## Learning Episode

A student puts a picture of the Sun in the right place on the Hertzsprung–Russell diagram and tells the rest of the class about the past and the future of the Sun as a star according to its position on the diagram.

Time: 8 min

## Learning Episode

The students exchange with peers detailed information related to the presentation and create the poster about star evolution depending on the initial star mass.

Time: 10 min

## Materials needed for this lesson

1. PowerPoint Presentations about star characteristics and star evolution
2. The documentary film “Evolution of stars” (<http://www.youtube.com/watch?v=hYsJhjEOtjk>)
3. Database with physical characteristics of stars
4. Poster templates

## **Reflection/Notes to Self**