



LESSON: OBS

Title: OBS
Author: Sandy Mills-Alford

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School/Org: AliveTek, Inc.

Lesson Overview:

Operational Bioinstrumentation System (OBS) refers to the set of medical devices that is designed to monitor the vital signs of the astronauts during space travel. This lesson set should really appeal to those students who have an interest in medicine. The OBS console has potential to offer great life science, anatomy, and physiology discussions as well as related computational activities. The KLASS software provides data of vital signs of two astronauts during the launch countdown. To incorporate more math into the lesson, you could have students perform basic conversions and monitor each other's vital signs with inexpensive equipment. Even though this curriculum focuses on the Shuttle launch, there is a wide-range of activities and reference sites pointed out in the Extensions and Going Further section below about space suits and living in space.

Suggested Classroom Time: 120-180 minutes

Grade Levels: 6-10

KLASS Module: 1-Training

Topic/Console: OBS Console

Materials Needed:

Activity	Documents	Other Materials
1	RDG_OBS.doc Additional Info: RDG_OBS-Additional (Folder of documents) Cardiopulmonary.wmv and Cardiovascular.wmv (videos) http://science.ksc.nasa.gov/shuttle/technology/sts-newsref/sts_egress.html#sts_bio http://spaceflight.nasa.gov/shuttle/reference/shutref/crew/obs.html	Demonstration computer with projection
2	ACT_OBS.doc KEY_OBS.doc ACT_OBS-Console.doc (for use with console)	Student computers, KLASS software for OBS, and writing tools

National Standards/Objectives:

Discipline	Standard	Objective
Science	F. Science in Personal and Social Perspectives	Students understand the risks, benefits, and the importance of environmental quality.
Science	C. Life Science	Students understand human regulation and behavior.
Technology	Technology problem-solving and decision-making tools	Students use technology resources for solving problems and making informed decisions.
Math	Representation	Students create and use representations to organize, record, and communicate mathematical ideas.

Desired Results:

Students will be able to answer these essential questions

- Who monitors the health of the astronauts during launch?
- What will I need to know as a member of the KLASS Shuttle launch team that monitors and controls the OBS console?
- How can I contribute to a larger group within a complex operation such as OBS?

Students will know

- The basic responsibilities of the OBS engineers.
- How to record a sequence of OBS data from the KLASS console.
- The five data feeds of the OBS console.

Students will be able to

- Record accurate observations while observing a variety of data feeds by the KLASS OBS console.
- Assimilate into the role of OBS engineer by monitoring, correcting and communicating data to the larger launch team.

Learning Plan/Activities:**1. Introducing the Lesson.**

Review the reading document and help students understand what the OBS team does. With your class, visit any websites you believe are appropriate to help them better understand this important system. There are two introductory videos that you may find worthwhile to play in your class, so review them.

2. Observing, Labeling, and Recording.

Based on the *OBS* reading document (RDG_OBS.doc), have the students work through the activity sheet (ACT_OBS.doc). Next, have the students start the OBS console and get used to reading and recording the data. A worksheet has been provided for this purpose (ACT_OBS-Console.doc). Depending on how much you would like them to record, you may want to adjust the worksheet. Note that the acceptable ranges are listed under each of the vital sign readings, with the exception of blood pressure.

3. Evaluating the Lesson.

During the above activities, students should be making the connection between the real OBS function and the KLASS OBS. Follow up this activity by reinforcing the key roles that will be needed for the KLASS simulation. Revisit the *KLASS Launch Team Roles* handout (RDG_KLASS-Team-Roles.doc), paying attention to the OBS description of responsibilities.

Assessment Evidence:

Performance Tasks

1. Students will be able to discuss the important vita signs that are monitored during launch (and landing) by completing the activities.
2. Students should begin to understand the function of the OBS KLASS module and the data that is referenced and used during the simulation.

Extensions and Going Further Resources:

- Depending on the age group and your available equipment, you could assign the role of astronaut to two students and have OBS engineers monitor their vital signs during launch.
- The NASA website does have a lot of health-related resources, but not many of them provide specific information about the OBS systems during launch. Below are some good resources for further exploration about astronauts in space. Also below, for your reading you will find the official documentation, which is limited. The related topics are interesting, though.
http://science.ksc.nasa.gov/shuttle/technology/sts-newsref/sts_egress.html#sts_bio
<http://spaceflight.nasa.gov/shuttle/reference/shutref/crew/obs.html>
- NASA Anatomy.
<http://www.nasa.gov/externalflash/MedicalBenefits/main.html>
- A few abstracts from OBS related reports may be quick learning bites for you or your class.
<http://aero-defense.ihs.com/news/star-06H1/star-0421-space-transportation-safety.htm>
- Take a look at the Development of the Spacesuit, From Past to Present (With movie).
http://www.nasa.gov/audience/foreducators/topnav/materials/listbytype/A_Look_at_the_Development.html
http://www.nasa.gov/audience/foreducators/topnav/materials/listbytype/A_Look_at_the_Development.html
- Speaking of space suits, here is an educator's guide.
http://www.nasa.gov/audience/foreducators/topnav/materials/listbytype/Suited_for_Spacewalking_Educator_Guide.html
http://www.nasa.gov/audience/foreducators/topnav/materials/listbytype/Suited_for_Spacewalking_Educator_Guide.html
- This lesson, specifically might be good.
http://www.nasa.gov/pdf/166966main_O2_How_Much.pdf
http://www.nasa.gov/pdf/166966main_O2_How_Much.pdf
- Cool suits activity.
http://www.nasa.gov/audience/foreducators/topnav/materials/listbytype/Cool_Suits_Activity.html
http://www.nasa.gov/audience/foreducators/topnav/materials/listbytype/Cool_Suits_Activity.html
- Spacesuits and How They Work (a little more advanced).
http://www.nasa.gov/audience/foreducators/topnav/materials/listbytype/Spacesuits_and_How_They_Work.html
http://www.nasa.gov/audience/foreducators/topnav/materials/listbytype/Spacesuits_and_How_They_Work.html
- Apollo OBS results.
<http://history.nasa.gov/SP-368/s6ch3.htm>
- Be sure to check for student opportunities, additional educational resources and more at:
<http://www.nasa.gov/education>