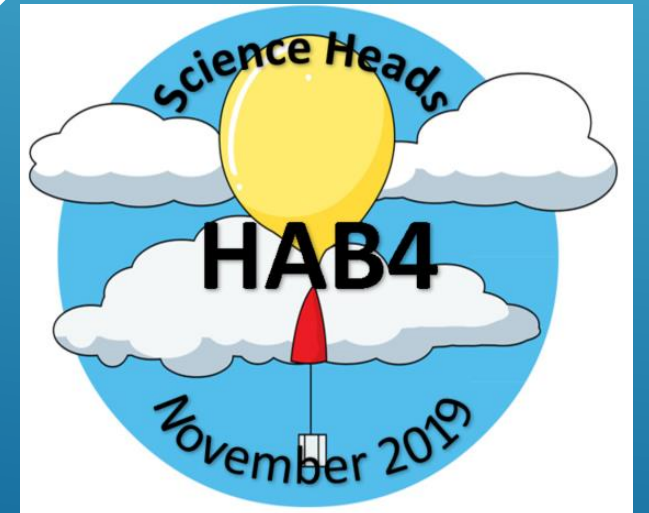





HAST-C WORKSHOP 1

Mr. Richard Stember, HAB4 Flight Director

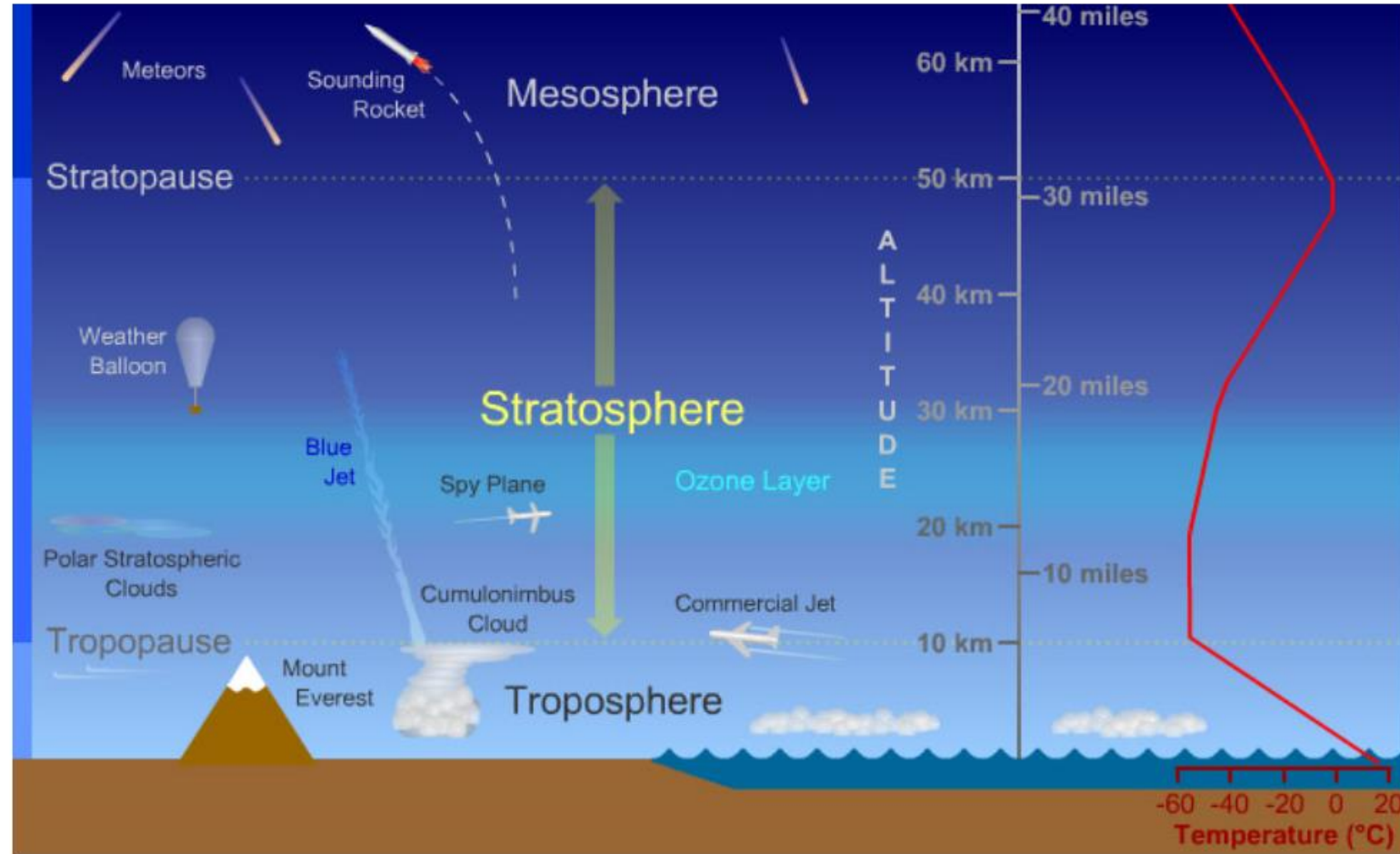
Mr. Robert MacHale, Science Communications
Specialist (SCICOM)



WHAT IS HAST-C?

- High Altitude - What do we mean by “high altitude”?
 - Science - What is science?
 - Team - Break up into teams.
 - Challenge - Each team is being challenged to conceive of, design, propose, build and run an experiment.
- 

HOW HIGH DOES THE HAB GO?



The stratosphere is the second layer (going upward) of Earth's atmosphere. It is above the troposphere and below the mesosphere. The ozone layer is within the stratosphere. The temperature gets warmer as you go higher in the stratosphere. Credit: Randy Russell, UCAR

WHAT ARE THE CONDITIONS AT HAB ALTITUDE?

Average:	Earth @ 110,000 Ft (20 miles)	Mars @ surface
Pressure:	0.162 psi	0.087 psi
Temperature:	-50 Deg F	- 85 Deg F
UV Radiation: ¹	3.2 rads per year	8.0 rads per year
Cosmic Radiation	9 microsieverts / hr	30 microsieverts / hr

¹ <https://www.universetoday.com/14979/mars-radiation/>

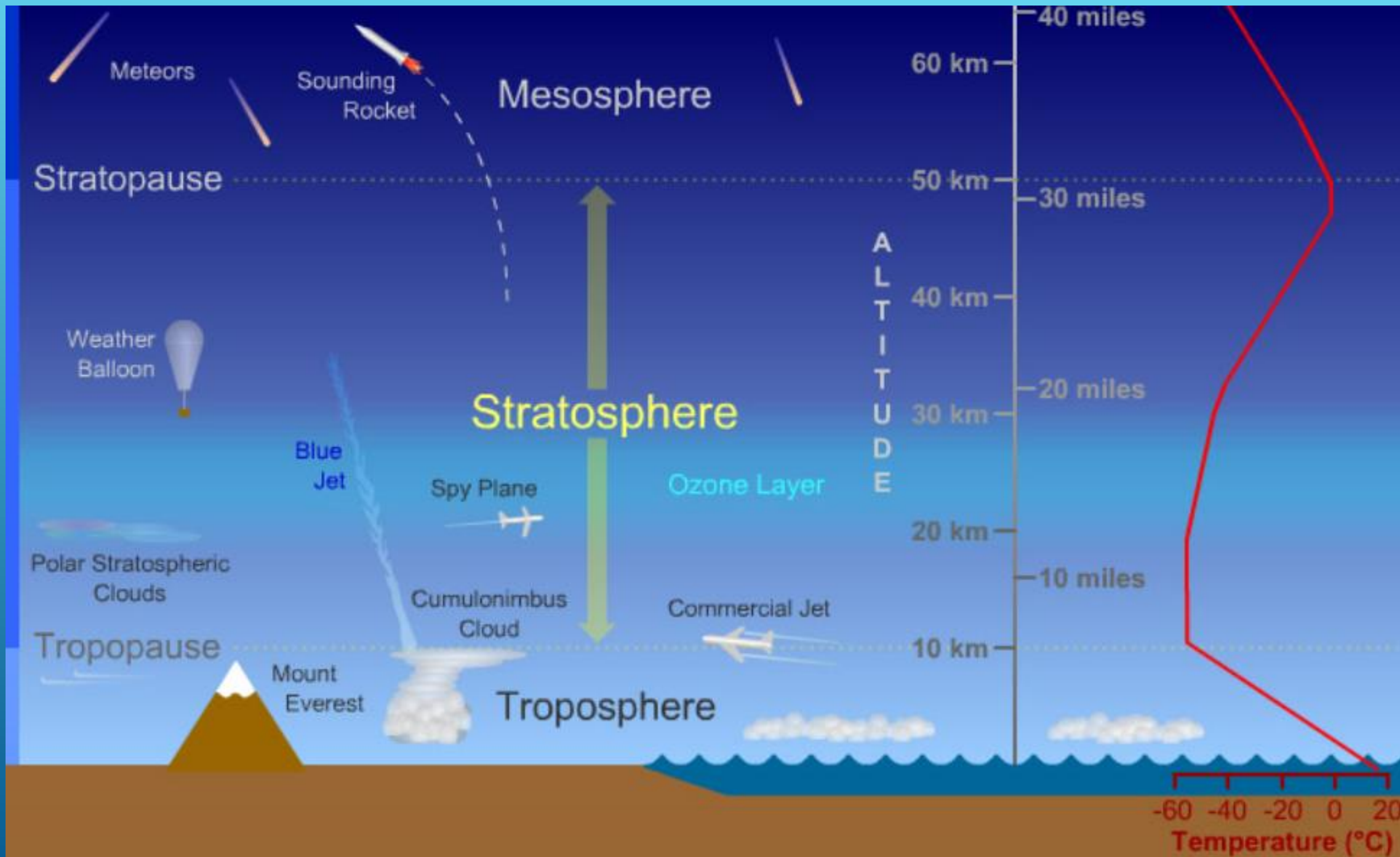
WHAT DO WE NEED TO UNDERSTAND TO LIVE ON MARS?

How well will things that we use work?
Batteries? Electronic devices?

Can we grow food there?
What grows well in this environment?

Will we need special materials?
For clothing? For shelter?

A decorative graphic consisting of several parallel white lines of varying lengths, slanted diagonally from the bottom right towards the top right, set against a blue background.



OZONE LAYER – PROTECTS US FROM HARMFUL UV RADIATION

What is the average Ozone concentration?

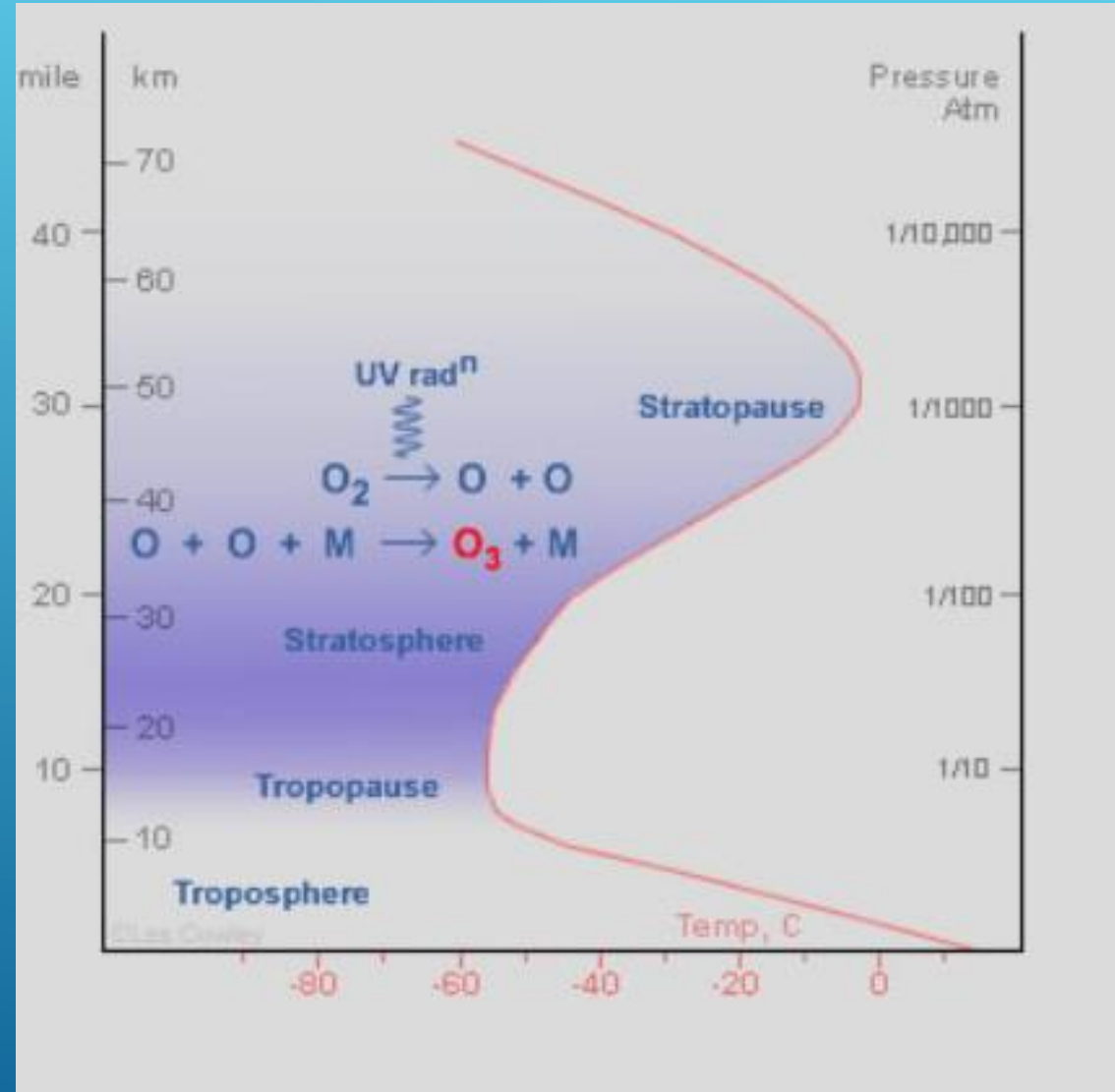
At what altitude does the Ozone layer start?

At what altitude does it end?

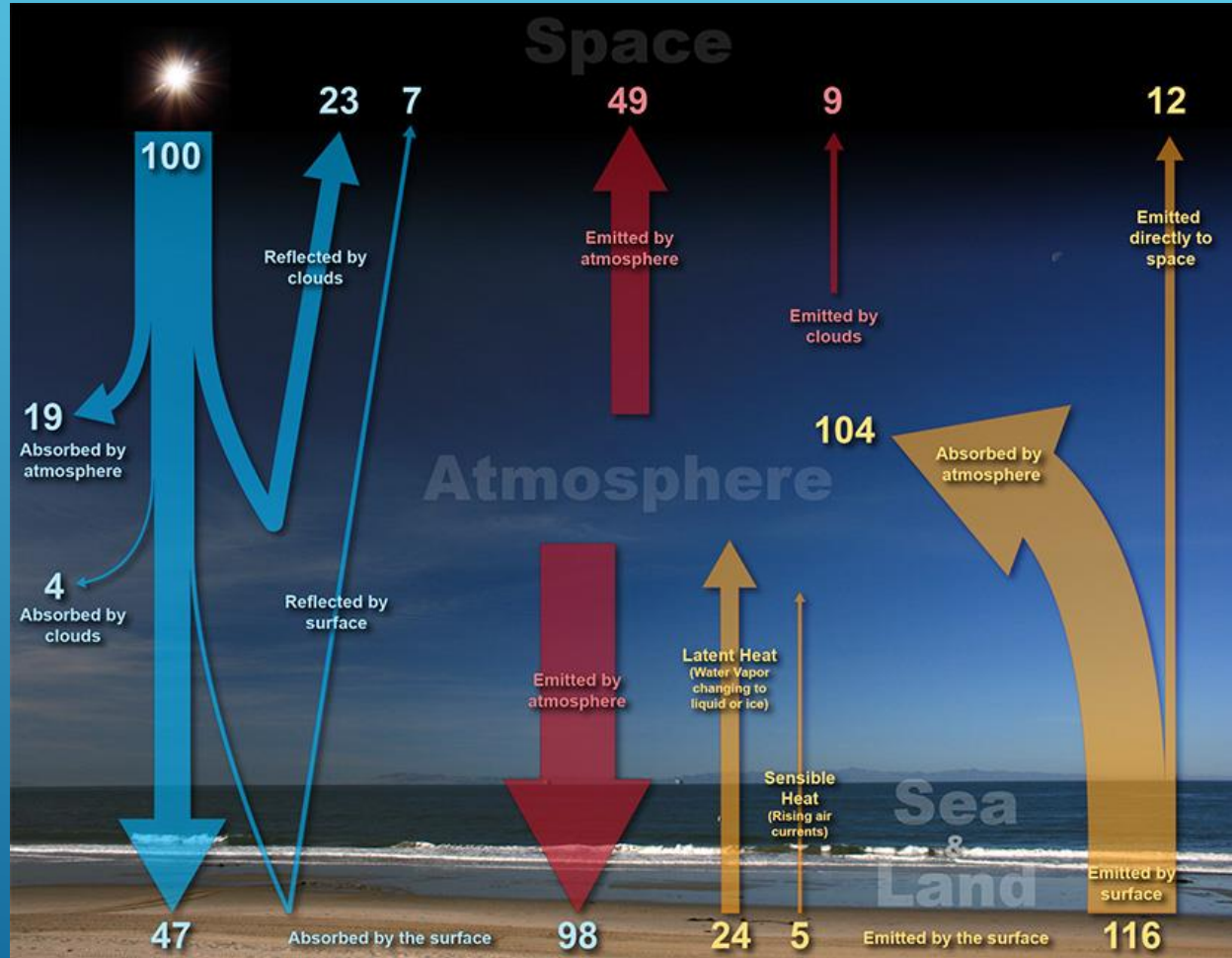
What are the UV levels at these altitudes?

What is the temperature?

How do these factors effect ozone formation?



THE EARTH'S ENERGY BALANCE



Source: <https://www.weather.gov/jetstream/energy>

ORGANIZE INTO TEAMS

Discuss what areas of investigation interest your team.

Research your topics here and at home.

Each of you formulate questions to be answered
- at least 3 per team.

Think about how an experiment could answer your questions.

Be prepared to describe what you have learned and the questions that you have formulated at our next workshop.

