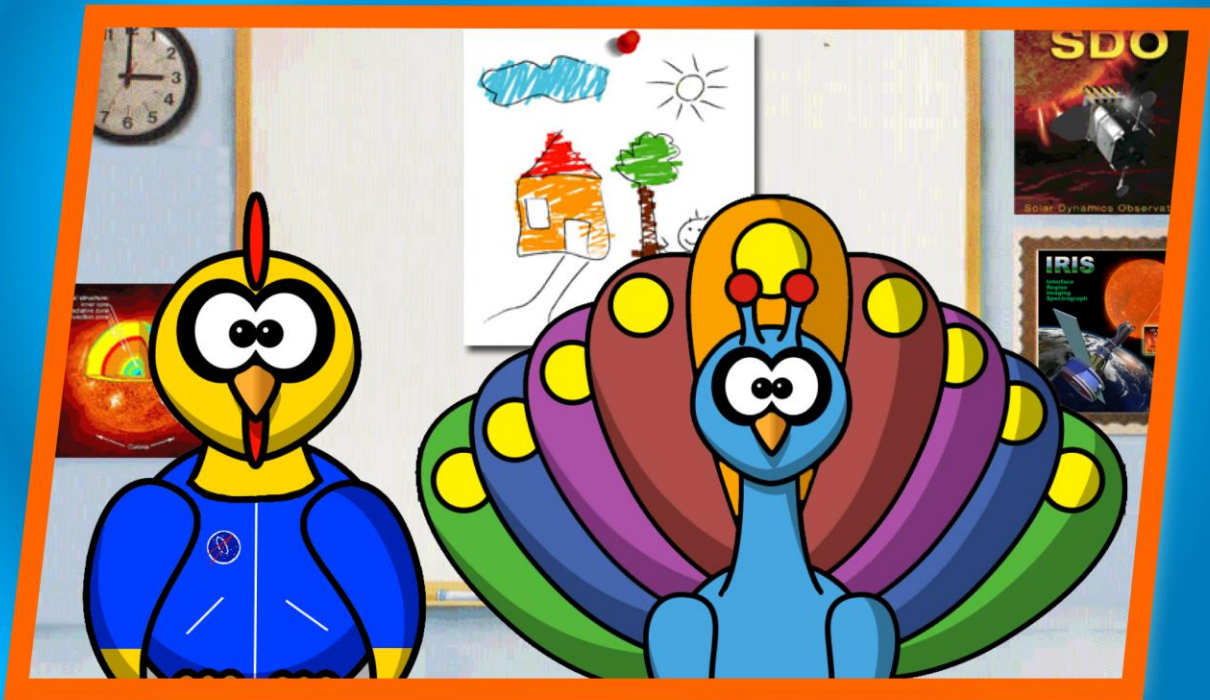




# TALES FROM STANFORD SOLAR

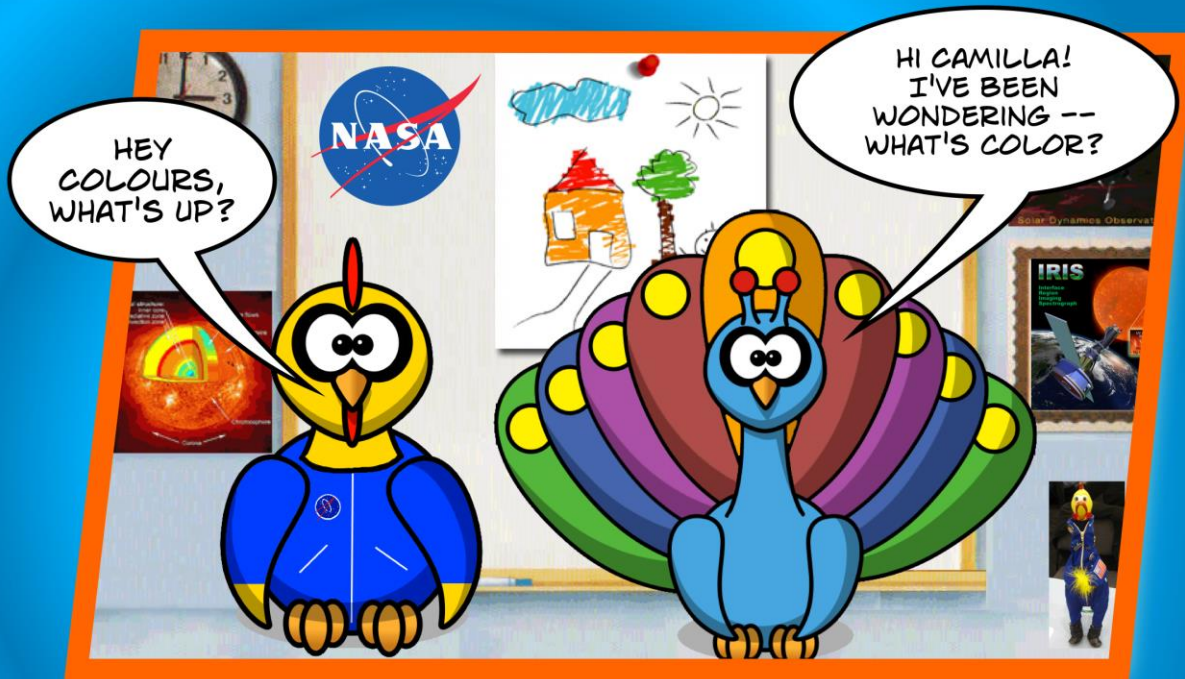


## WHAT IS COLOR?

FEATURING CAMILLA CORONA AND COLOURS O'IRIS



# WHAT IS COLOR?





OUR SUN PRODUCES ENERGY -- DIFFERENT FORMS OF LIGHT. LIGHT WE SEE, VISIBLE LIGHT, LOOKS WHITE. THAT'S WHY THE SUN, CLOUDS, AND MOON ARE WHITE. HIDDEN INSIDE VISIBLE LIGHT ARE ALL THE COLORS.

YOU'VE SEEN A RAINBOW?

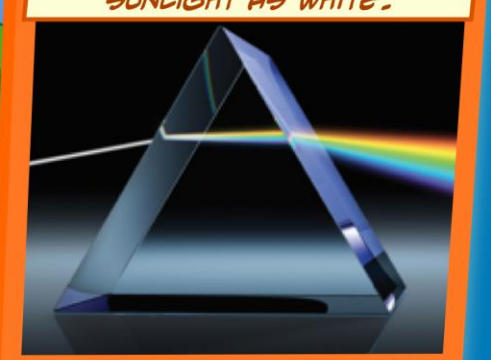
OF COURSE -- I AM A RAINBOW!

*RAINBOWS SHOW THE COLORS IN LIGHT.*



WHY IS SUNLIGHT WHITE?

*OUR EYES EVOLVED TO SEE THE MIXTURE OF COLORS IN SUNLIGHT AS WHITE.*



MIXING ALL PAINT COLORS MAKES ICKY BROWN?

PAINTS ARE PIGMENTS (MATTER) NOT LIGHT (ENERGY) -- THEY WORK DIFFERENTLY.

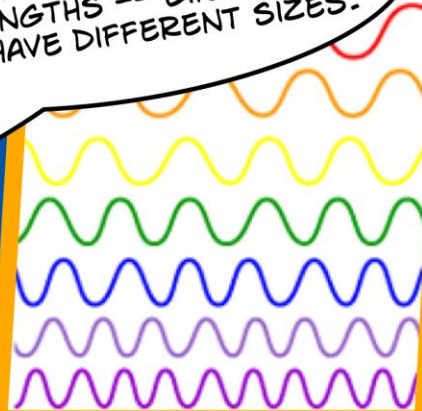
BUT THE SUN LOOKS YELLOW???



IT ONLY LOOKS YELLOW  
AT SUNRISE OR SUNSET.



COLORS HAVE DIFFERENT  
WAVELENGTHS -- LIKE OCEAN  
WAVES HAVE DIFFERENT SIZES.



RED AND ORANGE HAVE LONG  
WAVELENGTHS, LIKE BIG WAVES...



...THAT ROLL OVER ROCKS.



BLUE AND VIOLET HAVE SHORT  
WAVELENGTHS, LIKE SMALL  
WAVES...



...THAT SCATTER WHEN THEY  
HIT ROCKS.



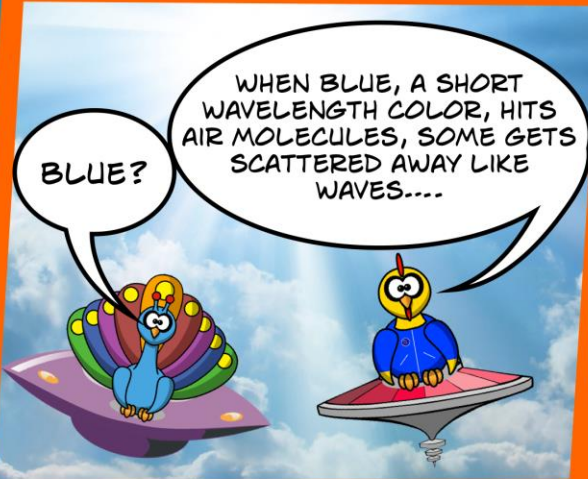




AIR MOLECULES ACT LIKE ROCKS WITH WAVES.

SUNLIGHT AT NOON GOES THROUGH LITTLE ATMOSPHERE, HENCE FEW "ROCKS".

COLORS (EXCEPT SOME BLUE) GET THROUGH AND THE SUN LOOKS WHITE.



BLUE?

WHEN BLUE, A SHORT WAVELENGTH COLOR, HITS AIR MOLECULES, SOME GETS SCATTERED AWAY LIKE WAVES....

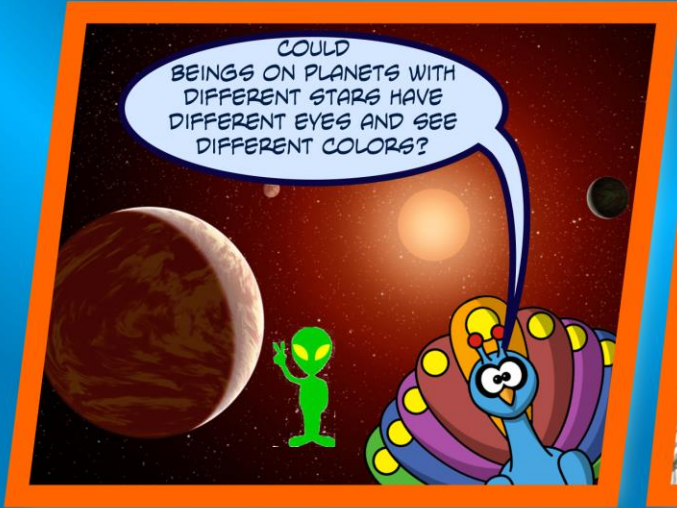


...AND BOUNCES AROUND THE ATMOSPHERE CAUSING THE SKY TO LOOK BLUE!

SUNLIGHT GOES THROUGH MUCH ATMOSPHERE AT SUNRISE OR SUNSET. ONLY REDS, ORANGES, AND YELLOWS (LONG WAVELENGTHS) SURVIVE THE "ROCKY" ATMOSPHERE.











# SOLAR RESOURCES

## ABOUT NASA SOLAR MISSIONS:

**SDO** - [HTTP://SDO.GSFC.NASA.GOV/](http://sdo.gsfc.nasa.gov/)

**IRIS** - [HTTP://IRIS.GSFC.NASA.GOV/](http://iris.gsfc.nasa.gov/)

**STEREO** - [HTTP://WWW.NASA.GOV/MISSION\\_PAGES/STEREO/MAIN/](http://www.nasa.gov/mission_pages/STEREO/main/)

**SOHO** - [HTTP://SOHOWWW.NASCOM.NASA.GOV/](http://sohowww.nascom.nasa.gov/)

FOR MORE INFORMATION ON COLORS:  
[HTTP://WWW.WEBEXHIBITS.ORG/CAUSESOFCOLOR/](http://www.webexhibits.org/causesofcolor/)

GREAT NASA ACTIVITIES:  
[HTTP://NASAWAVELENGTH.ORG](http://nasawavelength.org)

## FOR STUDENTS:

THE STANFORD SOLAR CENTER HAS A LARGE COLLECTION OF ACTIVITIES, VIDEOS, AND IMAGES TO EXPLORE:

[HTTP://SOLAR-CENTER.STANFORD.EDU/ACTIVITIES](http://solar-center.stanford.edu/activities)

FEATURES OF THE SUN -- A GREAT INTERACTIVE GAME WHERE YOU ARE A SOLAR SCIENTIST!

[HTTP://LASP.COLORADO.EDU/HOME/EDUCATION/K-12/PROJECT-SPECTRA](http://lasp.colorado.edu/home/education/k-12/project-spectra)

## SPACE WEATHER CENTER

LOTS OF GREAT GAMES AND FUN ACTIVITIES:

[HTTP://WWW.SPACEWEATHERCENTER.ORG/ACTIVITY\\_PAGE/01/01.HTML](http://www.spaceweathercenter.org/activity_page/01/01.html)

## FOR TEACHERS:

### SDO FOR EDUCATORS

ELEMENTARY AND SECONDARY LEARNING UNITS

[HTTP://SDO.GSFC.NASA.GOV/EPO/EDUCATORS/](http://sdo.gsfc.nasa.gov/eпо/educators/)

THE STANFORD SOLAR CENTER HAS A LARGE COLLECTION OF LESSONS, MOSTLY 4-12

[HTTP://SOLAR-CENTER.STANFORD.EDU/TEACHERS](http://solar-center.stanford.edu/teachers)

NOVA'S SUN LAB - GREAT LESSONS AND STUDENT ACTIVITIES

[HTTP://WWW.PBS.ORG/NGBH/NOVA/LABS/LAB/SUN/](http://www.pbs.org/nova/labs/lab/sun/)

## OUR STAR THE SUN

COLLECTION OF SUN-THEMED CLASSROOM RESOURCES FROM NASA'S SOLAR AND HELIOSPHERIC OBSERVATORY

[HTTP://SOHOWWW.NASCOM.NASA.GOV/CLASSROOM/CLASSROOM.HTML](http://sohowww.nascom.nasa.gov/classroom/classroom.html)

# WHAT IS COLOR?

STORY: DEBORAH SCHERRER  
DESIGN: EMILY KELLAGHER

STANFORD SOLAR CENTER  
[HTTP://SOLAR-CENTER.STANFORD.EDU/](http://solar-center.stanford.edu/)



FUNDING BY NASA/SDO/HMI  
NASA/SDO/EVE  
NASA'S IRIS MISSION

COPYRIGHT © 2014 STANFORD UNIVERSITY. ALL RIGHTS RESERVED. PERMISSION GIVEN TO USE FOR EDUCATIONAL PURPOSES.

THIS COMIC WAS ORIGINALLY DEVELOPED FOR THE ALAN ALDA FLAME CHALLENGE, AN INTERNATIONAL CONTEST ASKING SCIENTISTS TO COMMUNICATE COMPLEX SCIENCE IN WAYS THAT WOULD INTEREST AND ENLIGHTEN AN 11-YEAR-OLD. THE 2014 FLAME CHALLENGE QUESTION WAS "WHAT IS COLOR?" THE ANSWER MUST BE LESS THAN 300 WORDS.

[HTTP://WWW.CENTERFORCOMMUNICATINGSCIENCE.ORG/THE-FLAME-CHALLENGE-2/WHAT-IS-COLOR/](http://www.centerforcommunicatingscience.org/the-flame-challenge-2/what-is-color/)