

INTRODUCTION

How do you make images of things in space? When a telescope captures data, they do not arrive as an assembled snapshot. Instead, the spacecraft streams data encoded in the form of ones and zeroes, which are eventually translated into various formats, including images. Satellite and spacecraft images are not really photographs, but pictorial presentations of measured data in different bands of the electromagnetic spectrum (i.e. radio, infrared, visible, ultraviolet, X-ray, gamma ray).

When a satellite observes an object in space, its camera records photons. These photons come down to Earth from the spacecraft via a network in the form of 1's and 0's. Scientific software then translates that data into an event table that contains the time, energy and position of each photon that struck the detector during the observation. The data is further processed with software to form the visual representation of the object. One colored image is then assembled from separate black and white images taken through colored filters. Computer aided data collection and processing is an essential facet of research using space and ground-based telescopes. Scientists rely on computers, not only to do calculations, but also to change data into images.

This paper-based activity connects the process of making astronomical images by translating information from one form to another.

PROCESS

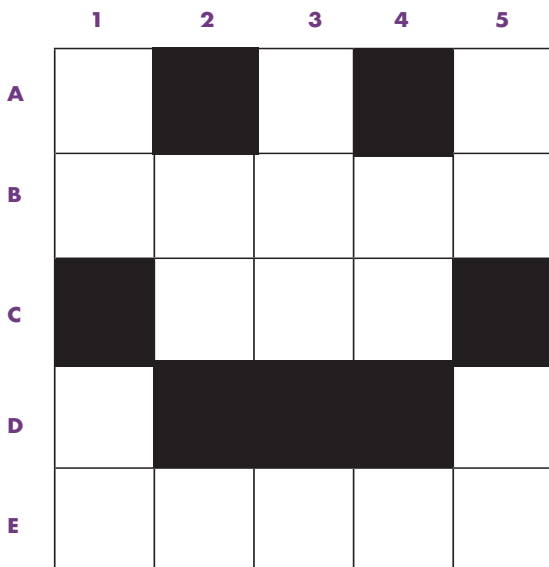
For Smiley Face:

Distribute blank 5 x 5 grids and pencils to participants.

Like Bingo, you'll call each pixel combination, letter then word. Each student will mark that square with an X.

The combinations are as follows: A2, A4, C1, C5, D2, D3, D4

Then, shade in the squares that are marked with an X.



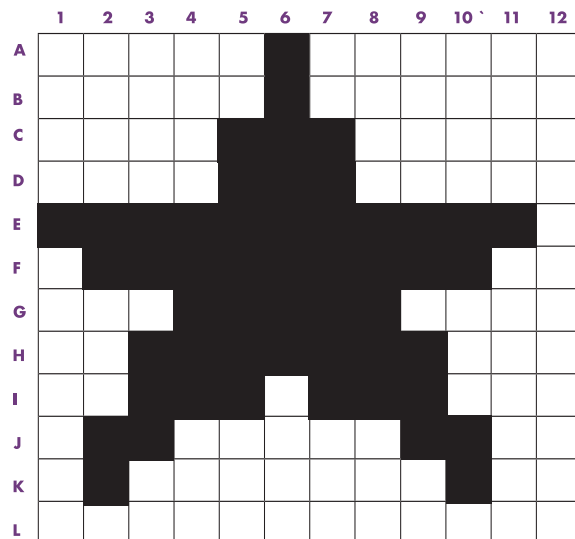
For Star:

Distribute blank 12 x 12 grids and pencils to participants.

Like Bingo, you'll call each pixel combination, letter then word. Each student will mark that square with an X.

The combinations are as follows: A6, B6, C5, C6, C7, D5, D6, D7, E1-E11, F2-F10, G4-G8, H3-H9, I3-I5, I7-I9, J2, J3, J9, J10, K2, K10

Then, shade in the squares that are marked with an X.



SEE NEXT PAGES FOR ENLARGED VIEWS.

EXERCISE 1

	1	2	3	4	5
A		■		■	
B					
C	■				■
D		■	■	■	
E					

1 2 3 4 5

A B C D E

1 2 3 4 5

A B C D E

