

OSIRIS-REX

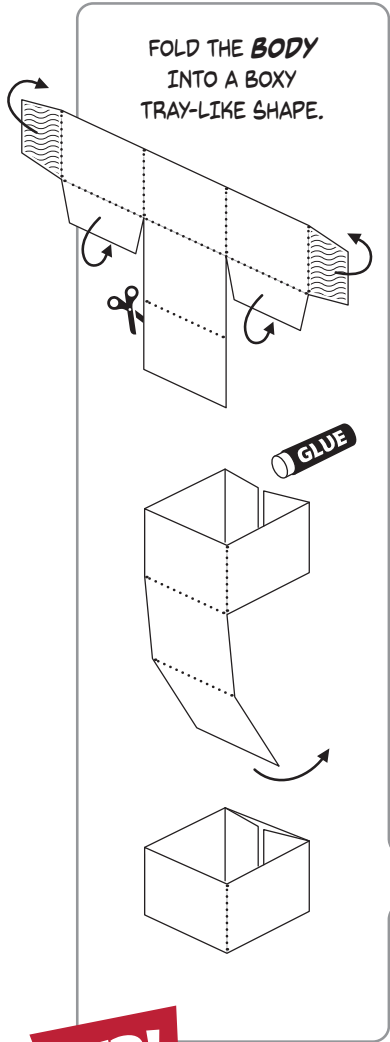


Our friend OSIRIS-REx has ventured boldly to the once-mysterious asteroid Bennu. After years of snapping photos and mapping this rocky world from afar, NASA's OSIRIS-REx spacecraft dove to Bennu's surface and grabbed a sample of its rocks and dust as a souvenir. In September 2023, OSIRIS-REx will fly by Earth and drop the treasure from the sky. Scientists around the world will study the sample to learn about the origins of the solar system and life itself. After returning the sample, OSIRIS-REx will begin a new journey – one that will take our friend around the sun to another asteroid named Apophis.

Experience the wonders of the extraordinary asteroid explorer by creating your very own OSIRIS-REx in paper craft form! Join this remarkable journey and let your imagination soar as you decide where your paper craft OSIRIS-REx will explore next.

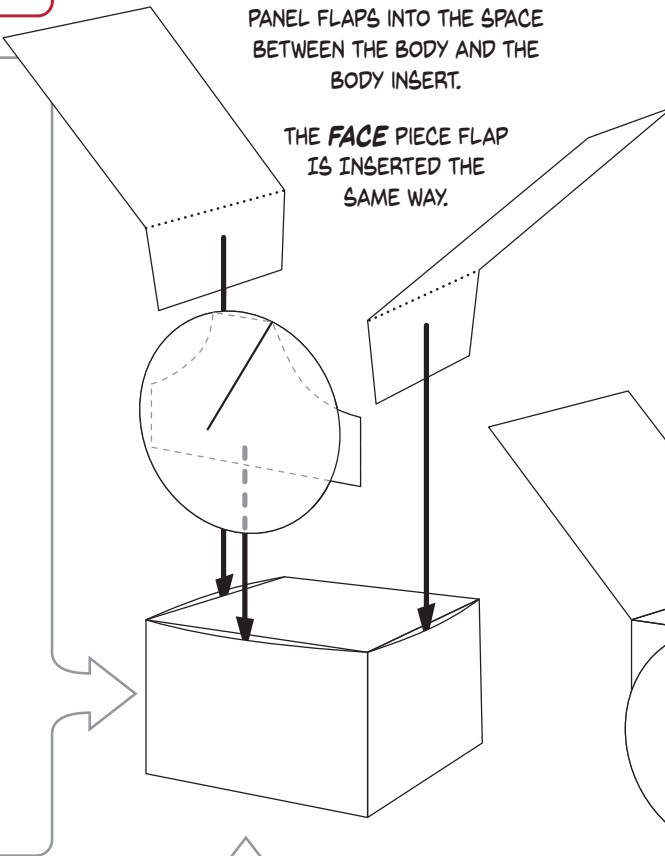
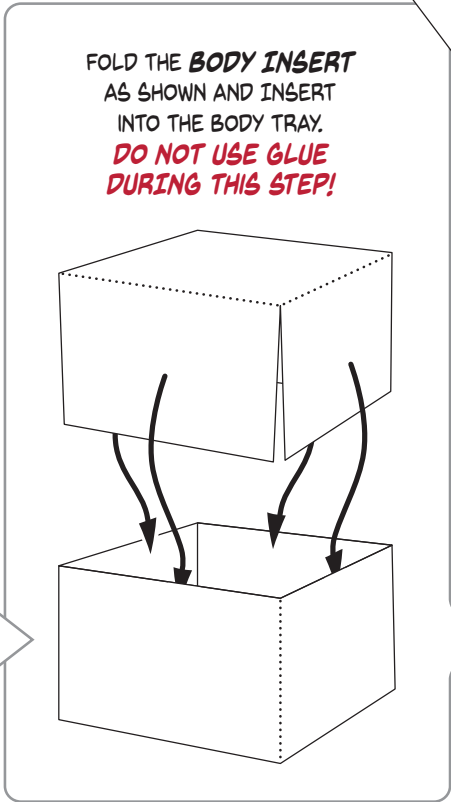
NASA GODDARD UNIVERSITY OF ARIZONA LOCKHEED MARTIN

Learn about the mission at www.AsteroidMission.org and visit www.KookyCraftables.com for more paper craft fun!



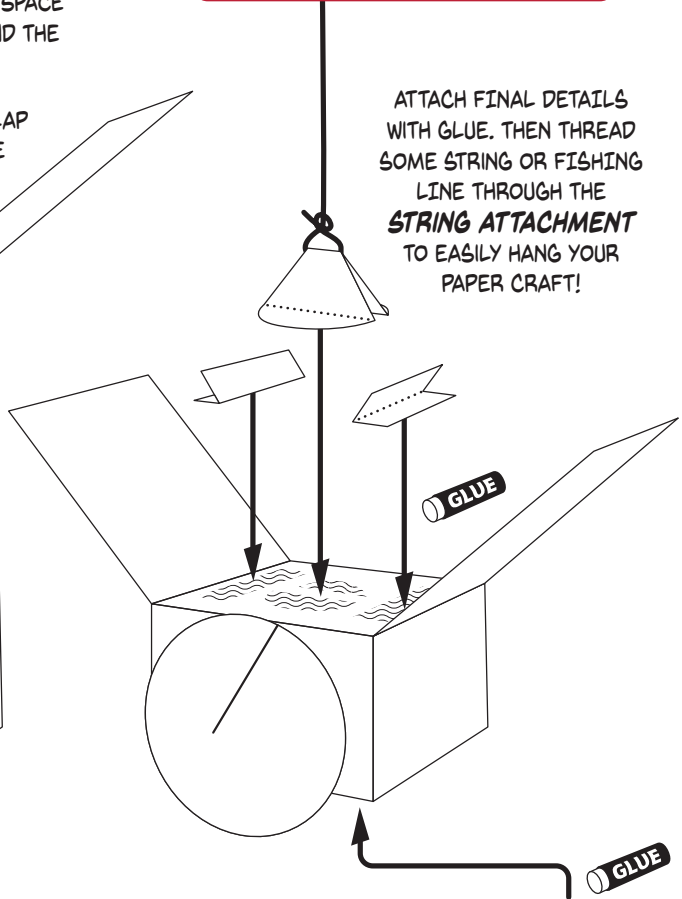
KEY!

- CUT OUT WITH SCISSORS
- MOUNTAIN FOLDS
- VALLEY FOLDS
- GLUE ZONES



SEE!

WATCH A FUN TUTORIAL VIDEO ABOUT THIS PROJECT AT WWW.KOOKYCRAFTABLES.COM



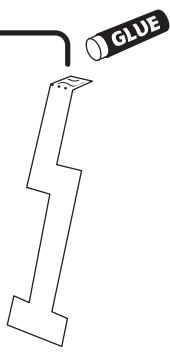
TIP!

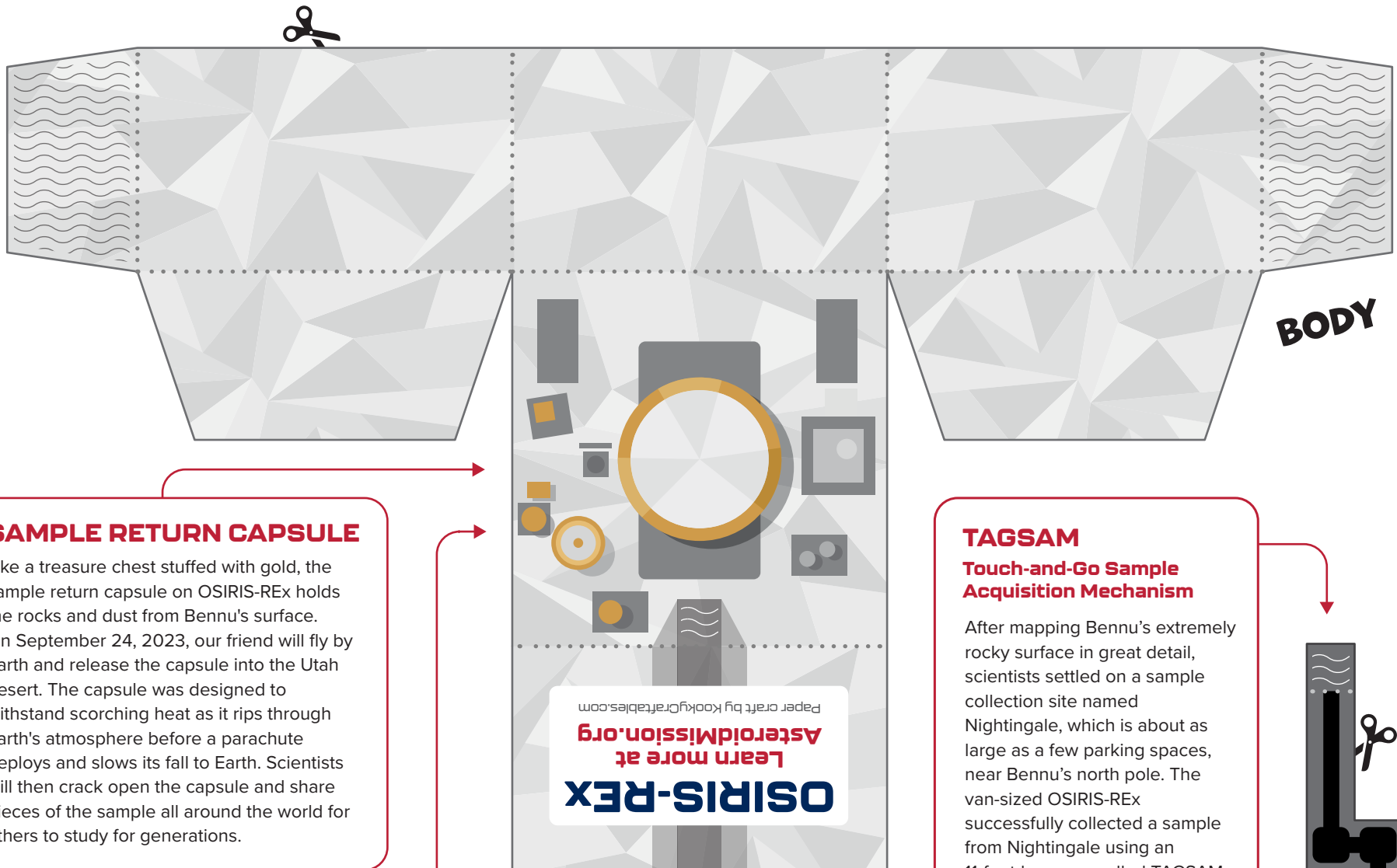
PRE-CREASE ALL FOLD LINES BEFORE APPLYING GLUE. FOR PERFECT FOLDS USE A SCORING STYLUS ON THE DOTTED LINES USING A RULER AS A GUIDE. IF YOU DON'T HAVE A SCORING STYLUS, THE ROUND EDGE OF A PAPER CLIP WORKS TOO!

CUT OUT THE **FACE** AS SHOWN. MAKE SURE TO CUT ON THE SOLID LINE ALL THE WAY TO THE CENTER OF THE CIRCLE.

APPLY GLUE AND THEN OVERLAP THE RADIUS LINE TO MAKE THE FACE FORM A SHALLOW CONE SHAPE.

FOLD TAB DOWN





SAMPLE RETURN CAPSULE

Like a treasure chest stuffed with gold, the sample return capsule on OSIRIS-REx holds the rocks and dust from Bennu's surface. On September 24, 2023, our friend will fly by Earth and release the capsule into the Utah desert. The capsule was designed to withstand scorching heat as it rips through Earth's atmosphere before a parachute deploys and slows its fall to Earth. Scientists will then crack open the capsule and share pieces of the sample all around the world for others to study for generations.

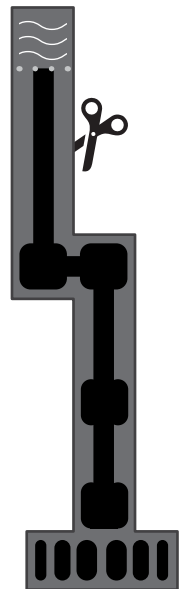
INSTRUMENT ARRAY

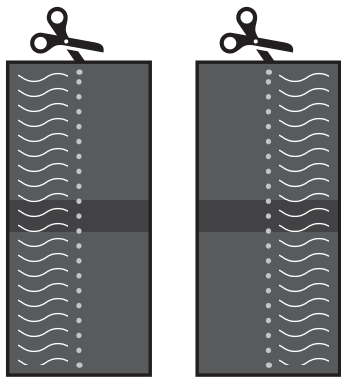
Like a toolbelt, OSIRIS-REx's instrument array allows our friend to get to work in space. The cameras, some of which were designed by University of Arizona scientists, were used to map the asteroid Bennu, pick a sample collection site and ensure that the sample was correctly stowed on the spacecraft. PolyCam was the first to spot Bennu from 1.4 million miles away. NavCams used the stars to navigate through space like a sailor at sea and used boulders and craters on Bennu to navigate around the asteroid. OSIRIS-REx also carries infrared and x-ray vision instruments!

TAGSAM

Touch-and-Go Sample Acquisition Mechanism

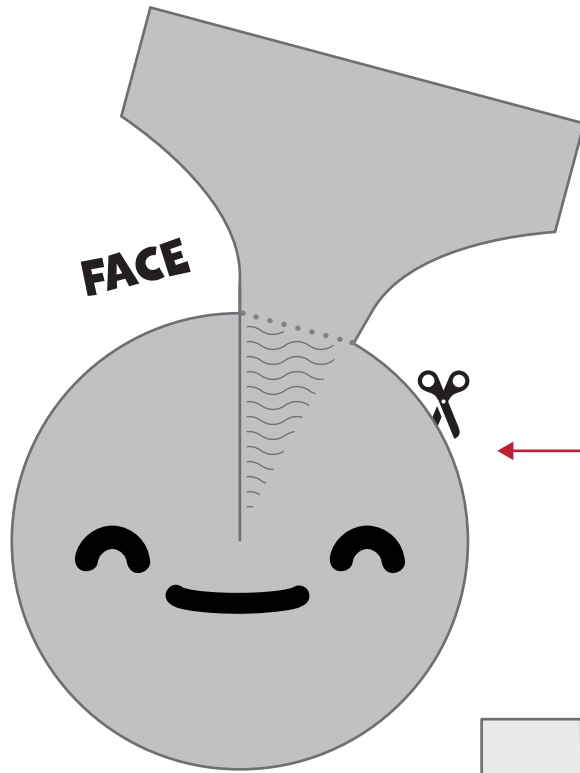
After mapping Bennu's extremely rocky surface in great detail, scientists settled on a sample collection site named Nightingale, which is about as large as a few parking spaces, near Bennu's north pole. The van-sized OSIRIS-REx successfully collected a sample from Nightingale using an 11-foot-long arm called TAGSAM. When OSIRIS-REx struck Bennu's surface, our friend stowed away the rocks and dust that were kicked up in the process. Bennu is so loosely bound, TAGSAM sank 1½ feet into the surface, sort of like punching a ball pit. OSIRIS-REx then quickly fired the thrusters to retreat to safety.



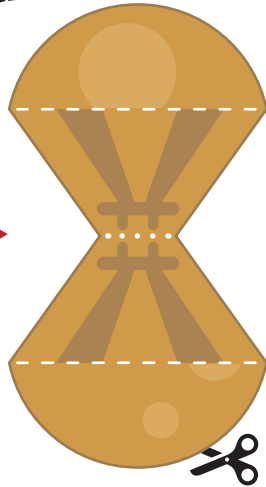


SUN SHADES

It gets hot out there in space! With no atmosphere to protect OSIRIS-REx from the direct sunlight, our friend was outfitted with many sun shades to help protect sensitive instruments.

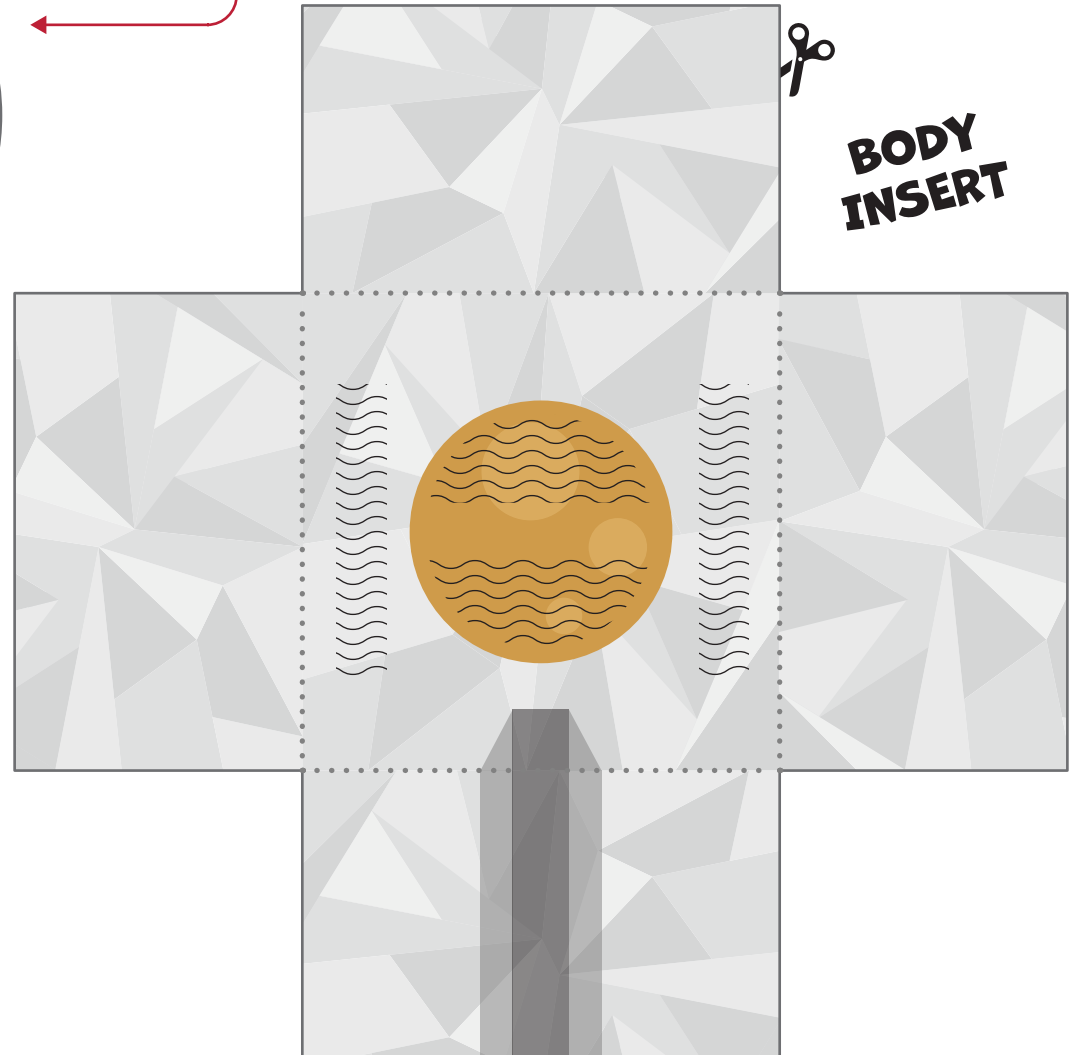


STRING ATTACHMENT



HIGH GAIN ANTENNA

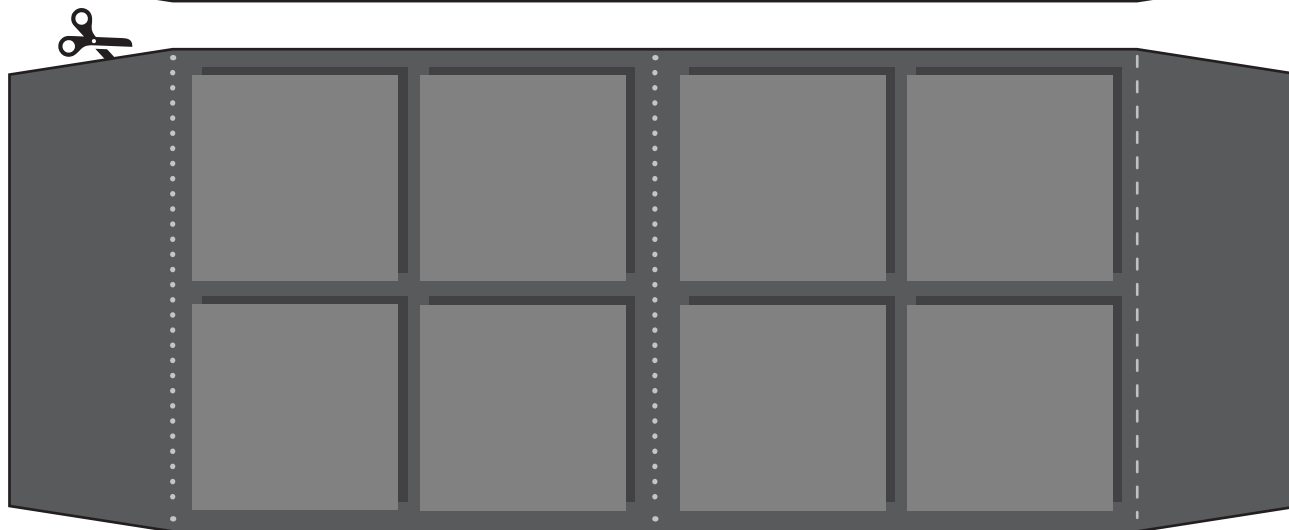
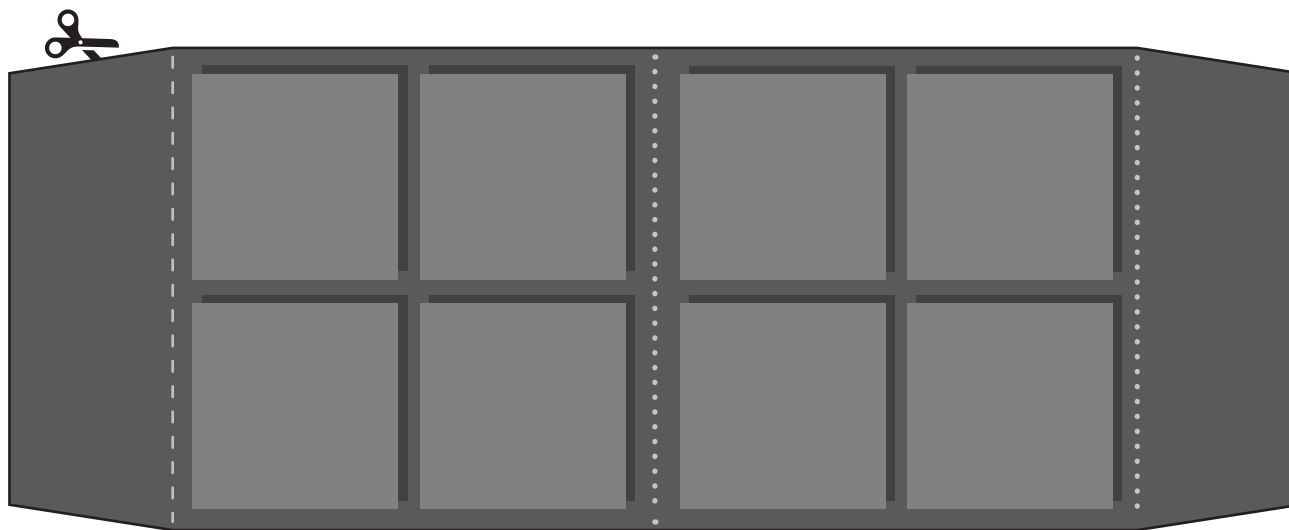
The high gain is the largest antenna onboard and is the voice of OSIRIS-REx. It is a 6-foot-wide dish that can talk to mission control when looking precisely back at Earth, sometimes millions of miles away. Specialized ears, or satellite dishes, on Earth listen for what our friend is saying – usually about data from Bennu. Scientists can also use satellite dishes to send messages back to OSIRIS-REx.



BODY INSERT

MAIN ENGINE

Navigating around an object as small as Bennu (which is still bigger than the Empire State Building) takes a lot of care and precision, so scientists equipped OSIRIS-REx with 28 thrusters of various sizes. The main engine is made up of the four most powerful thrusters and is used for big moves in deep space.



SOLAR PANELS

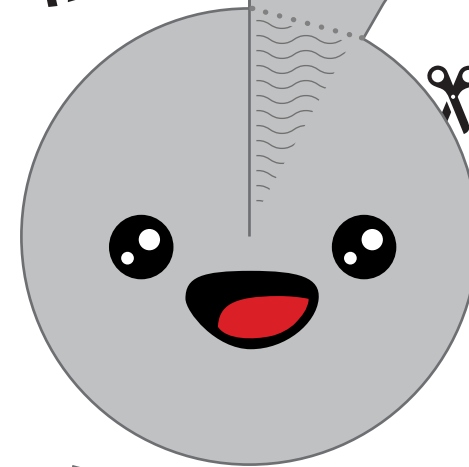
OSIRIS-REX's two solar panels collect sunlight to power our friend. Usually, the solar panels are turned toward the sun, but during the dive to collect a sample, they were positioned like a "Y" to keep them safe from flying rocks and dust.

Where in the world is your OSIRIS-REX?

Share a picture on your favorite social media platform with [#PaperOSIRISREX](https://twitter.com/PaperOSIRISREX)

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**BONUS
FACE!**



**INVENT
A FACE!**

