Lesson 1: Launch Your Research

UNIT: Investigating Asteroids

TRANSCRIPT

HOOK 1

Hi, writers. It's Anne.

My friend has a daughter named Kristi. She's in the fifth grade. Recently, she came home from school and seemed kind of upset.

Her mom asked her what was going on. She said, "It's because a huge asteroid is going to hit the Earth. I don't know what will happen."

Her mom was confused. She asked Kristi where she'd heard that, and Kristi explained.

She heard it from Raj, who had heard it from Natalie, who overheard it from Sean, who had heard it from Isabel, who saw it in Andrew's notebook he had borrowed from Joel, who heard it from Kim. Hang on. Hang on. That sounds like one big game of telephone.

Where did this information start?

Well, it turns out Kristi's classmate Nate had been talking with a friend about a camping trip where he saw a meteor shower. Nate was explaining that meteor showers are when asteroids or other small rocks in space hit the Earth's atmosphere and burn up. That creates beautiful streaks in the sky.

But then someone overheard the conversation.

And they said, "Nate saw an asteroid hit the Earth," who told someone else, "An asteroid hit the Earth." And on and on and on, until it got to Kristi as a huge asteroid is going to hit Earth.

Information changing as it goes from person to person is pretty normal.

When people hear something interesting, they like to share it with their friends. Sometimes they share things a little differently—and maybe accidentally false.

Now that Kristi knows how this all started, she isn't so worried anymore.

But then she began to think, "How many other kids came home from school concerned or unsettled by hearing that an asteroid is going to hit the Earth?"

Kristi knows that if they knew more about asteroids, they probably wouldn't be so worried.

DISCUSSION 1

Discuss: What do you think Kristi could do to share information with her classmates?

HOOK 2

Maybe you said she could tell everyone at school one at a time. That could be tough. Maybe you thought she could give a presentation or write something for the school announcements: "The Earth is safe." Kristi has a lot of options—but hang on.

Just because Kristi knows this rumor started because someone overheard about Nate's meteor shower, does that really mean it's not true? How does she know a big asteroid isn't going to hit Earth?

She doesn't want to be another person sharing information that she only *thinks* is true. She needs to be sure.

To do that, she'll have to research all about asteroids and get her information from a trusted source. A trusted source is a place that would have the most current and up-to-date information about asteroids.

DISCUSSION 2

Discuss: Where would you go to find the most current or up to date information about asteroids?

HOOK 3

Maybe you said you'd ask an adult or go to the library and find a book on the topic. That's a great start. Maybe you said you'd look on the internet.

The internet definitely gets updated all the time. But the problem is anyone can post anything they want on the internet, like this.

- *"Asteroids are giant boogers in space."*

Wait. What? That can't be right.

- *"Order now to get your food delivered by an asteroid."*

I don't know about that.

To use internet sources, Kristi knows the best place to look would be websites written by actual space scientists—like NASA, the National Aeronautics and Space Administration. She could also look for news articles from published news sources like Time for Kids.

Kristi's school has a monthly newsletter that gets read in every classroom. She thinks that if she can learn more through research, she could write an article and help her classmates know more about asteroids instead of being nervous about them.

Kristi needs your help to research all about asteroids and how the Earth is protected from them. That way, she can inform her classmates—and you can inform your school too—about the possibility of an asteroid impacting the planet.

Today, you'll look at two sources that Kristi has found. You'll take notes about each one and record where you got your information in a list of sources. Writers call this a bibliography.

That way, everyone who reads your writing will know where the information came from and that it didn't come from a big game of telephone.

I'll get you started, step by step.

STEP 1

Get your supplies. You'll get more supplies later on.

STEP 2

In today's lesson, you'll need someone to share ideas with. This could be a partner or someone you sit near. When everyone knows who their talk partner is, move on to the next step.

STEP 3

The first source Kristi found is from a Time for Kids' article. The article is about NASA's DART Mission.

The mission's goal was to change the path of an asteroid by crashing an unmanned spacecraft into it. Even though the asteroid was not on its way to Earth, this experiment could prove that NASA can change an asteroid's path if a dangerous one ever came along.

Get Source 1 and your Glossary. The Glossary can help you understand some of the scientific words in this text.

Get ready to follow along as I read Source 1. For now, just listen and follow along. We'll take notes later on.

When you're ready to hear the text aloud, move on to the next step.

STEP 4

Operation Asteroid

By Jeffrey Kluger and Jaime Joyce

Published by Time for Kids November 3, 2022.

Mission managers at NASA sent a refrigerator-sized craft 7 million miles into space. Its job was to punch an asteroid in the nose. We should be glad NASA did this. Earth feels a little bit safer now.

The spacecraft is called DART. That stands for Double Asteroid Redirection Test. It was launched in November 2021. DART was made to fly out to the asteroid, Dimorphos and crash into it. Why? To see if the impact could speed up the asteroid's orbit around another space rock, Didymos. Neither of these asteroids poses a danger to Earth. But in the future, other asteroids might.

The cosmic crash took place on September 26, 2022. For the mission to succeed, NASA calculated that DART would have to change Dimorphos's orbit by at least 73 seconds. On October 11, at the Kennedy Space Center, in Florida, the DART team announced its results: The collision sped up Dimorphos's orbit by 32 minutes.

It's too soon to say exactly what the DART results mean for the future. But now we know it's possible to change the velocity of an asteroid. Nancy Chabot is on the DART

team in Laurel, Maryland. She says the point of programs like DART is to give the asteroid a "little nudge." That would be enough to keep it from colliding with Earth.

If you want to hear this text again, replay this step. Otherwise, move on to the next step.

STEP 5

Look at how Kristi took notes on this Source. She didn't take notes on the whole thing. Instead, she looked at one part at a time.

In each section of the article, she looked for specific information she could use in her writing. But she didn't want to copy what another writer wrote. She was extra careful to avoid copying any entire sentences into her notes.

Look at the first paragraph in Source 1 and silently reread it.

Show a silent thumbs up when you're done.

STEP 6

Kristi started by looking for keywords and phrases that she thought would help her reader know her main idea—The Earth is protected from asteroids.

She saw this sentence.

- Its job was to punch an asteroid in the nose.

That sentence is pretty funny, but it doesn't really have the information she's looking for. Instead, she underlined "NASA". So she can include who sent this craft. Then she underlined "Earth" and "safer now." So she can remember that this craft was designed to protect earth.

Underline these words in your copy of Source 1.

STEP 7

Next, Kristi used her underlined words to help write a note about asteroids. She only wrote a few words to remember the information she selected. She wrote:

- NASA sent spacecraft - protect Earth

Notice how she didn't copy any whole sentences and only wrote a few words.

Add Kristi's first note into the first box on your Source 1 worksheet.

STEP 8

Let's look at the next piece of text together. Silently reread the next paragraph in Source 1. Show a silent thumbs up when you're done.

STEP 9

Think about which parts of this paragraph would help your reader understand how Earth is protected from asteroids. Your reader probably doesn't need to know every single detail about this mission. As the writer, you get to decide which details your reader should know.

Underlying keywords and phrases that you think are important.

STEP 10

These are the words Kristi underlined. It's okay if you underlined something different.

Use the important words you underlined to make a note about what you want to include in your writing. Use just a few words and remember to not copy any complete sentences.

If you want to take more than one note,put each note in its own box.

STEP 11

Here's what Kristi wrote. It's okay if you wrote something different.

There are two paragraphs left. For each one, silently reread it, underline any keywords or phrases, and add important information to your notes. Then go on to the next paragraph and do the same.

Show a silent thumbs up when you've completed both paragraphs.

STEP 12

Nice job taking notes on the first Source!

With your partner, share the notes that you took. If your partner wrote a note that you like but don't have, you can add it to your notes page in its own box. If you want, you can also add some of Kristi's notes.

NATURAL STOPPING POINT

STEP 13

Great job writers! You've taken notes on one source about asteroids. Now you'll gather notes from a second source. To do that, get these supplies.

STEP 14

This Source is from the NASA Science Space Place. In this Source, you'll learn more about asteroids and how the Earth's atmosphere protects Earth from small rocks in space.

Get your Source 2 worksheet. Keep your Glossary handy in case there are words you don't know.

Get ready to follow along as I read Source 2. When you're ready to hear the text aloud, move on to the next step.

STEP 15

What is an Asteroid

By Jessica Stolar Conrad

Published by NASA Science Space Place, August 26, 2021.

Asteroids are small, rocky objects that orbit the sun. Although asteroids orbit the sun like planets, they are much smaller than planets. There are lots of asteroids in our solar system. Most of them live in the main asteroid belt—a region between the orbits of Mars and Jupiter.

Will an asteroid ever hit Earth?

There are no known impact threats, but tiny meteors burn up in Earth's atmosphere all the time!

Meteors

A meteor is a space rock—or meteoroid—that enters Earth's atmosphere. As the space rock falls toward Earth, the resistance—or drag—of the air on the rock makes it extremely hot. What we see is a "shooting star." That bright streak is not actually the rock, but rather the glowing hot air as the hot rock zips through the atmosphere.

But not to worry!

The meteoroids are usually small, from dust particles to boulder size. They are almost always small enough to quickly burn up in our atmosphere, so there's little chance any of them will strike Earth's surface. But there is a good chance that you can see a beautiful shooting star show in the middle of the night!

If you want to hear this text again, replay this step. Otherwise, move on to the next step.

STEP 16

In this Source, look for information that will teach your reader that Earth is protected from asteroids.

On your own, reread each paragraph one at a time. Underline any important information that you want to include in your writing. Then, write a note using just a few words in one of the boxes. Be sure to put each new piece of information in its own box.

Your teacher will tell you how long you have to take notes.

STEP 17

Nice job taking notes on the second source. With your partner, share the notes that you took. If your partner wrote a note that you like but don't have, you can add it to your notes page in its own box.

STEP 18

Before you wrap up your research for the day, you'll need to record the sources you used in your Bibliography—a bibliography or source list lets readers know where a writer got their information. They can usually be found at the end of a piece of writing.

Get your Bibliography worksheet.

The gray box at the top of the worksheet shows you all the information you'll need from each source. You'll need the name of the author, the date the text was published, the title of the text, the name of the organization that published it, and the website address. Kristi has already put the websites in the Bibliography for you.

Find number one on the Bibliography worksheet. The name of the author is already filled in, and the title—but the date and the publisher are missing.

Look at your Source 1 worksheet. Find where the publisher and date are located on the worksheet. Give a thumbs up when you've found them. If you need help, look at this section of the text.

STEP 19

Fill in number one on your Bibliography worksheet by writing the date and publisher in the two blanks.

STEP 20

Check with your partner to see if the information you found for your Bibliography matches. If it doesn't, check Source 1 to find the missing information.

STEP 21

Find number two on your Bibliography worksheet. The name of the publisher is already filled in for you, but there are three missing pieces of information. Look at your Source 2 worksheet to fill in the missing information.

STEP 22

Check with your partner to see if the information you found for your Bibliography matches. If it doesn't, check Source 2 to find the missing information.

STEP 23

Leave number three and four blank for now. You'll add to your Bibliography in the next lesson.

All the worksheets to use today are the start of your research packet. Stack them with the bibliography on the top, then the glossary, then Source 1, and Source 2. When they're all in a neat pile, staple them together using one staple.

STEP 24

The papers in your packet are V.I.P.s—very important papers. Your teacher will tell you where to put them so you will have them for the next lesson.

WRAP UP

Great job researchers! You took notes on two sources and recorded them in your Bibliography.

In the next lesson, you'll get to listen to some interviews and extend your research even more. It looks like maybe Kristi's classmates didn't have the most current information about asteroids. Luckily, they have you to help them learn more and stay up to date.

I'll see you next time.