

CHEETAH FUN!

6th-8th Activity Guide



The Cheetah Connection

Biomimicry has created a world of opportunity for humankind. Evaluate the adaptations of the cheetah that allow it to be super fast. Identify how we can benefit from similar technology and design a plan of action.



A Race Against Extinction

Cheetahs may be designed to run but the race they are in today requires our help to win. So get ready, get set and GO!



Cool Down and Get Creative

While cooling down like a cheetah after a chase, learn all about how dogs are saving these cats and so can you!



Take Action

Getting involved in conservation can be relatively easy and enjoyable. As a class, participate in a citizen science project called Snapshot Ruaga.



Curriculum Connection

Have ideas to make this curriculum better? Please share them at CheetahSAFE@livingdesert.org

SEVEN WAYS TO JOIN THE RACE TO SAVE THE CHEETAH



Join us at The Living Desert or right in your classrooms every December 4th for cheetah fun facts, activities and conservation action in observance of International Cheetah Day.



Spread the word with friends and family about what you are learning. Encourage others to take action with you.



Adopt a cheetah at The Living Desert as a class and help us support the Species Survival Program by helping us to provide our coalition with the best care possible during their stay!



Help sponsor an Anatolian shepherd dog for farmers in Namibia to help reduce livestock-cheetah conflicts as a class.



Be a cheetah champion by seeking out and participating in Citizen Science opportunities.



Tell your friends and family to join the International Cheetah Day celebration annually on December 4th with you!



Take pictures of your class taking action for cheetahs this December 4th and submit them on our website to be shared on social networks highlighting how your class is a champion for conservation!

47900 Portola Ave, Palm Desert, Ca 92260



International Cheetah Day Suggested Activities 6th-8th

Overall Goal:

Students will become more aware of how cheetahs are unique and have amazing adaptations. They will be introduced to the unique story of the cheetah and humans are working hard to save this remarkable species from extinction.

1. The Cheetah Connection (Science + Technology + Engineering + Art + Math) (ELA)

NGSS Standard :

MS-ETS1-1

Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.

MS-LS4-4

Construct an explanation based on evidence that describes how genetic variations of traits in a population increases some individuals' probability of surviving and reproducing in a specific environment.

Objective:

Students will learn about the amazing adaptations of the cheetah while learning and experiencing the concepts of biomimicry.

Vocabulary:

Biomimicry Brainstorming Engineering Imitate Invent

Materials:

Video: <https://youtu.be/FBUpnG1G4yQ>
<https://internationalcheetahday.com/> - For facts on cheetah
 Lessons on Biomimicry if you would like to use them as curriculum:
<https://biomimicry.org/what-is-biomimicry/>
<https://biomimicry.org/biomimicry-examples/>
<https://biomimicry.org/stories-field/>
<https://biomimicry.org/resources/>

Paper, pencils, markers or colored pencils, ruler, pictures of cheetahs and fact sheets, the internet, books, cheetah worksheets

Informational Resources:

<https://biomimicry.org>

Find the tab that says Biomimicry 101

Introduction:

Cheetahs have amazing adaptations that allow them to run up to 70-75PMH. Take a look at some of there adaptations that make this possible:

1. Rough paw pads – like a dog for traction
2. Semi-retractable claws for traction –(felines have fully retractable claws, only the cheetah has this semi-canine trait)

3. Flexible and muscular spine similar to a greyhound, that springs them forward reaching strides that can surpass 21 ft!
4. Long slender legs that can take high impact like a greyhound
5. Aerodynamic body structure that provides little resistance
6. A muscular tail that acts as a rudder to allow for sharp sudden turns
7. Tear marks on their face help reflect the glare of the sun while hunting during the day
8. Large sinuses for maximum air intake
9. Large lungs and heart to take that air in and distribute massive amounts of oxygen to the rest of the body

This is not all inclusive, there are other amazing adaptations but discovering those can be a fun activity too for your students.

From their claws to their spine, it is clear cheetahs are made for speed. Cheetahs can reach their top speed of 70-75 MPH in 3 seconds, faster than a Lamborghini! Watch this video of a cheetah running and learn all about how they spend most of their time completely in the air while running at these remarkable speeds! <https://www.youtube.com/watch?v=icFMTB0Pi0g>

Nature has perfected the concepts of aerodynamics and so much more with the cheetah's design in order to create the fastest land animal. What can we learn from this animals adaptations that can help us to be more sustainable, or more efficient? Biomimicry is the science of doing just this. Nature has perfected existence on this planet over millions of years. By looking at these designs we can make our technology better and thus, our lives.

Procedure:

1. Give a background either through video or oral communication about biomimicry. Having pictures of this in action is great like a hummingbird and helicopters.
2. Divide the class into 3-4 groups and hand out their cheetah workbooks
3. Have the students gather information on cheetahs and record their findings taking note of the advantages and disadvantages of their features.
4. After gathering this information they should brainstorm what kinds of things humans do or try to do that could benefit from the designs found in the cheetah, such as their flexible spin and its spring like action for propelling them forward. They should follow the guidelines set on their brainstorming page, to keep comments positive, be wild and adventurous in your ideas, all ideas are to be recorded, and each idea should be explored by the group while they stay focused on the topic and respect each other by holding one conversation at a time.
5. When all ideas have been explored the group should choose one and begin designing and sketching their idea.
6. They will need to brainstorm materials that would be needed, the dimensions, both for a scaled prototype and the real thing and create a shopping list of supplies required.
7. Students should do research if possible online to find out how much their supplies would cost and make a budget.
8. When the design, materials list and budget are complete the group will need to come up with a group name.
9. Then they will present their idea to the class detailing the entire process with an emphasis given to how this idea was stemmed from the features of a cheetah.

Closure Please take pictures - Send the picture/s to CheetahSAFE@livingdesert.org

Have all of the groups put their ideas on a separate table and lay one piece of blank poster paper next to it. Let the groups wonder around to each table and give their positive feedback about the groups idea. They can also leave a positive addition, a personal idea to expand upon those already suggested.



Evaluation:

Once this is complete the students will come together and share what their biggest take away was from this activity. Where did they struggle, what was the easiest? Gauge from this their interest and possibly move on to the Extension opportunity.

Extension Option:

If it is possible to do, have the students build their scale prototype and really get kinesthetic experience with biomimicry.



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Group: _____

Team Members:



Design Process Directions:

Follow this worksheet to organize your design process.

1. **Gather Information** about cheetahs: What are the cheetah's features? What are the advantages and disadvantages to these features?

2. **Brainstorm Ideas:** List things humans do or try to do that could benefit from the cheetah's design.

3. **Select a Design** and Sketch it: After discussing all of the ideas, select the most promising one.

Provide a brief description of your design:

The Cheetah Connection

Group: _____

4. Sketch idea: In the space below, draw a sketch of your idea. Include dimensions (the size) of each piece and the final product. Both for a scale prototype and the final piece.



The Cheetah Connection

Group: _____

Materials needed: What recyclable materials do you need for your project? (scaled prototype)



5. Evaluate and Finalize

1. List feed back and ideas collected after presentations from their peers:

2. Identify which feedback you have chosen to include in your final piece and why:

Paste a picture of the team working on their project here



2. A Race Against Extinction

NGSS Standard:

MS-ESS3-3

Human activities have significantly altered the biosphere, sometimes damaging or destroying natural habitats and causing the extinction of other species. But changes to Earth's environments can have different impacts (negative and positive) for different living things.

Objective:

Students will learn about the struggles facing the cheetah and about how they need us to take action.

They will also compare themselves to the cheetah through physical activity and a group race.

Vocabulary:

Endangered	Extinct	Threatened	Vulnerable
Habitat	Poaching	Genetic	Traditional

Materials:

Both:

Space for a race or obstacle course

1 large rope, 1 short rope, 25 - 5 ft string or yarn pieces, 8 small hooks with the eye, 3 – 4 small carpet squares, 1 small bucket, water, 8 chairs

Paint or Markers and banner paper for closure activity

Informational Resources:

Procedure:

- Before the students come to class, set up the obstacle course outside using rope or string.
 - The obstacle course should be simple and safe but include one sharp turn followed by small mats that represent fractured habitat surrounded by 4 chairs that show the limit of where the students can pass (it is supposed to feel cramped), places the cheetah cannot go and a spot of significant zig zag.
 - Take a small bucket and fill it $\frac{3}{4}$ full.
 - Take 8 pieces of string equal in length about 5 feet each and tie small hooks on the end that will be placed on the bucket rim. And place at the beginning of the course.
 - Take the smaller piece of rope (or string) and tie yarn to it dangling down about 5 ft so when held up it looks like a pouring rain they have to walk through.
 - Place 2 chairs for blockage across the path in the final stretch of the course along with the rope pre-set up to look like pouring rain – this is poaching pass.
- When you start the activity: On a chalk or white board put the number >10,000 and explain that > means more than.
- Ask students how many cheetah's they think there are in the wild >10,000 or <10,000. Then ask them their individual guesses as to how many there are.
- Write their guesses around the >10,000 you already wrote and if one of them said less than >7000, circle this number. If not, write it. Then introduce them to the vocabulary and concepts of Endangered Species categories and Criteria (briefly).
- After explaining that an endangered species is one that has a small population and is struggling to survive, tell them that the cheetah is one such species. Ask them why they think the cheetah may be struggling. Then explain to them that there are many reasons and that we, as a species, play a big part in it.
 - Habitat loss – As our population grows there is less and less area for species like the cheetah to live.

- b. Conflicts with Ranchers – Cheetahs have been blamed for many of the livestock losses in their native ranges. Ranchers need their livestock so they are protecting themselves and their livelihood by killing the cheetahs.
 - c. Poaching – People use the cheetah for many reasons including to sell as pets, for their beautiful coats, food and their organs in traditional medicinal practices.
6. Tell them that the cheetah is facing other things like disease and genetic breakdown as well. The good news is that we are becoming aware of these issues and we are making changes. It is impossible to make changes to help something if you have no idea it is happening and that is why sharing the message is so powerful.
7. Take the kids outside and put them in groups of 8. Explain that the water in the bucket is the remaining cheetahs and that each rope represents needs and wants of humans. The challenge is to work together to lose as little water as possible while working through the challenges that face the cheetah.
8. As they begin their walk they will hit a sharp turn to the right. This is habitat loss and the cheetah will immediately be required to adjust to stay within the spaces that are left for it as the path becomes narrow. Each holding the rope must follow this path, it will not be easy.
9. As they pass this, there will likely be loss of cheetahs, talk about this with the students as they continue on. They will next hit a zig zag, this is conflict with ranchers. The cheetah will need to “dodge bullets” weaving in and out to keep clear of the danger.
10. After passing this section the cheetah will have to pass through an area of high poaching, poaching pass. On the other side the path should end after a little straight path.
11. Repeat through your groups of 8. When all groups are done explain that there are many organizations working to save the cheetah and the 8 hands carrying the bucket represent them. However, more hands are needed. There are easy ways for each of us to get involved and one we will do today, that is sharing the message.

Closure: Please take pictures - [Send the picture/s to CheetahSAFE@livingdesert.org](mailto:CheetahSAFE@livingdesert.org)

Take the long banner paper and have the kids do an art project that they will hold up that says something like, #savethecheetah!

Then find a nice place and take a group picture of the kids holding the banner and tell them their picture is going to be sent to The Living Desert to be shared on social networks to get the word out that kids like you are getting loud for cheetah conservation!

Send the picture/s to CheetahSAFE@livingdesert.org

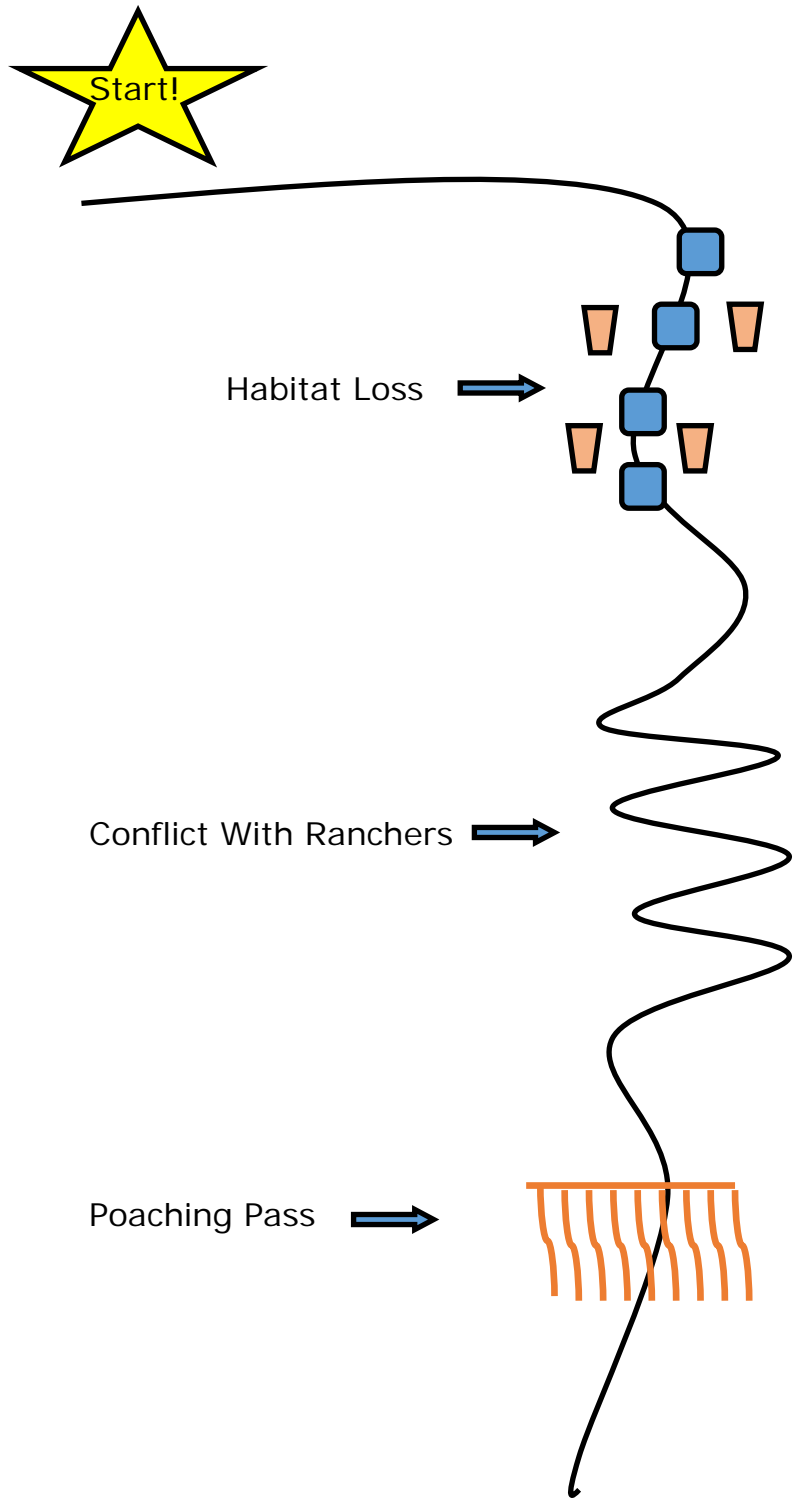
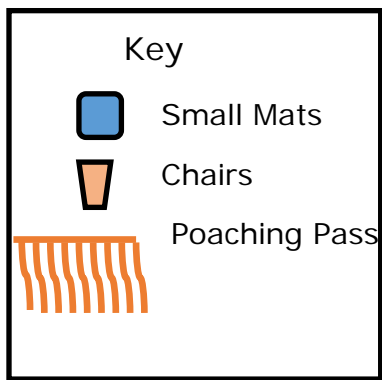
Evaluation:

Back at the obstacle course, take the students to each specific struggle and ask them what that “hurdle” or “obstacle” represented. Ask them what ideas they have on how to help cheetahs to get through this challenge in their natural habitat.

Extension option:

Share the Internationalcheetahday.org website that highlights many of the ways we are working to save the cheetahs today. Have a group discussion on the idea’s the students came up with earlier and see what the students come up with. We would love to hear about those ideas – Share them at CheetahSAFE@livingdesert.org





3. **Cool Down and Get Creative (Science + Art) (ELA)**

NGSS Standard:

MS-ESS3-3

Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.

Objective:

Students will learn about some creative ways people/organizations around the world are working to save the cheetahs from extinction. They will be introduced to the concept that the natural instincts of specific species have unique benefits for the coexistence and sustainability of multiple species including humans. By looking at the natural instincts, adaptations and behaviors of wildlife and domestic animals we can find uncommon solutions to common problems.

Vocabulary:

Scat Livestock Coexist Conservation Deterrence

Materials:

Video 1 – Anatolian Shepherd Dogs (Protection and Deterrence):

<https://www.youtube.com/watch?v=tnqiBEb9imw>

Video 2 – Scat Sniffing Dogs (Identification and Research):

<https://www.youtube.com/watch?v=yYw7UK6cX8E>

Article: <https://ensia.com/features/conservation-dogs/>

(6-7) Pill bottles/sealable vials, cotton balls, 3-4 different essential oils for scents, map of cheetah habitat - the area you wish to have them explore for clues: a classroom, outside area etc. With tracking stickers (optional: dog ears headbands) (This can also be done with a scenario much like an Easter egg hunt. Each egg has a scent inside it and is placed around a mapped out location. The students then have to investigate their surroundings for the eggs and once found identify if the scent is a cheetah).

Informational Resources:

<https://cheetah.org/2009/04/latest-on-ccf-scat-dog/>

<https://www.wired.com/2015/02/meet-poop-sniffing-dogs-saving-endangered-wildlife/>

<https://cheetah.org/2009/03/dogs-finding-cheetahs/>

Introduction:

Cheetahs used to roam all over Africa and even into Asia but today due to habitat loss and fragmentation, they only live in 10% of their once expansive habitat. How would you find out where the cheetahs are living in the wild today? The answer is in their poop!

Organizations like CCF and Cheetah Conservation Botswana use **scat sniffing dogs** to find cheetah poop to help collect important data on: where individual cheetahs are moving, how they are using their habitat, how many cheetahs are there and how much space cheetahs are using. Knowing this information will help inform where conservation biologist do their work and save critical habitat space.

Another important role that dogs play in the conservation of cheetahs has to do with their relationship with farmers. In the first video in the materials section you will hear from Dr. Laurie Marker about the out of the box solution that involves dogs, to save these cats. In Namibia cheetahs have been long blamed for livestock loss, the very livelihood of many of the people in coexisting with the cheetah. The solution came in “man’s best friend”, the Anatolian Shepherd dog armed with their size, protective instinct and trainability.



These sheep dogs protect the livestock without attacking the cheetah, it is a win-win for conservation. Learn more in the video and article above.

Procedure:

1. Before the students get into class:
 - a. Print range map (Or create one of your classroom) and dog paw print stickers.
 - b. Prepare scent vials as "scat"
 - i. Label one vial as "cheetah scat" and scented with one essential oil
 1. This is the key or base smell that guests will be smelling for.
 - c. Label all other vials as "unknown scat" and place them on the range map.
 - d. Scent 2 vials with "cheetah scat" essential oil
 - e. Scent the other vials with other essential oils
 - i. These will be other sympatric animals of cheetahs like leopard, lion, etc.
2. Have the students cool down from their race by watching one or both of the videos listed in the materials section. For a more literary approach there is also an article listed that can be used for reading and discussion.
3. After the videos and a brief discussion get the students prepared for an activity
 - a. Provide each student (that wants it) with a dog ears headband tell them they are scat sniffing dogs and have to track the movements of a cheetah through its range so we can study how it uses its environment.
4. Give them the vial labeled "cheetah scat" to smell
5. Let the students smell the "unknown scat" vials and place a dog paw print sticker on the map where they believe they found "cheetah scat" smell.
6. Reveal locations of "cheetah scat" and compare with their answers.

Closure: Please take pictures - **Send the picture/s to CheetahSAFE@livingdesert.org**

Close by discussing asking the students why scat sniffing dogs are so important. Remind them that Anatolian shepherd dogs are just as important and go over the key points on the part they play in cheetah conservation.

Evaluation:

Evaluate through observation and content questions especially during closure.

Extension option:

Have the students set up an area to run this activity during recess on other students at the school. While they are participating in this they can let others know that they are helping to spread awareness on cheetah conservation and that these dogs play a vital part. By having them be in charge of running the activity they become the teachers and will remember the information more. Remember to take pictures and send them in!



4. Take Action (Science + Art) (ELA)

NGSS Standard:

MS-ESS3-3

Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.

MS-ESS3-2

Analyze and interpret data to determine similarities and differences in findings.

Objective:

Students will take part in a citizen science conservation project to contribute to a research database on the community assemblages of savannah habitats and animal interactions in Tanzania.

Vocabulary:

Ungulate Fragmented Gazelle Conservation Elongated

Materials:

Laptop with internet connection, pictures of camera trap images (if available, camera trap)

Informational Resources:

<https://www.zooniverse.org/projects/meredithspalmer/snapshot-ruaha>

Introduction:

Cheetahs used to roam all over Africa and even into Asia but today due to habitat loss and fragmentation, they only live in 10% of their once expansive habitat. How would you find out where the cheetahs are living in the wild today without scat sniffing dogs? How can you explore the relationships carnivores have with the communities that live around them?

Citizen science has the answer! Researchers have developed an innovative model of community camera trapping to identify wildlife in different habitats while educating, employing villages.

“The mission of the Ruaha Carnivore Project is to achieve successful human-carnivore coexistence by empowering local communities, and to develop effective strategies for long-term carnivore conservation. We aim to reduce the costs and improve the benefits associated with wildlife, particularly carnivores, on village land and directly engage and empower local people in conservation.

We are also collecting the first detailed data on large carnivore conservation in this landscape, as this has been highlighted as a priority in regional and national carnivore conservation action plans. Our ecological research has led to the first scientific data and publications on Ruaha's carnivore populations, and has provided vital information for future conservation planning.”

(<https://www.zooniverse.org/projects/meredithspalmer/snapshot-ruaha/about/research>)

Procedure:

Depending on if each student has their own computer or not, you can do this individually or as a group. This will be oriented toward individual users applies if presenting it as a class.

Depending on if each student has their own computer or not, you can do this individually or as a group. This will be oriented toward individual users applies if presenting it as a class.

1. Start by going to the Snapshot Ruaha research page found in the introduction section just above and having this up when the students arrive. Talk with them about the project and tell them that often people think that getting involved in conservation take money they do not

have. However, there are ways to participate that can be fun and free such as Snapshot Ruaha! This is a Citizen Science activity everyone can participate in.

2. Have students go to the Snapshot Ruaha (link in Information resources but you can also just click the top left of the research page where it says the name in white letters) and click on get started. From here, they just need to read the instructions on the auto start tutorial and they are off to the races! This may take some time to get used to so I suggest doing this at home before class so you can be prepared to help them.
3. Encourage students not to stop participating. They can make a profile and continue to contribute as a citizen scientist at home!

Closure: Please take pictures - Send the picture/s to CheetahSAFE@livingdesert.org

Talk to the students about getting involved in conservation with everyday small actions like sharing the message on their social networks or just turning the water off when they brush their teeth. We can all make a big difference with our little actions. Share with them the seven ways to join the race on your invitation handout especially those that they can do themselves, for free.

Evaluation:

Ask the students to share how many animals they saw, how many different species. Did you see any you had never seen before? Gauge their involvement and understanding through dialogue and while you walk around during the activity.

Extension option:

Search out other Citizen Science projects and have your class get more connected to conservation right here at home!

