

Training Header Sheet with Change Log Form

Kentucky
Science - Grade 4
2022 Spring Op

SC041607_08
Light and the Structure of the Eye

Anchor Set

Date	Comments	Version
10/2022	Training Set	Set A

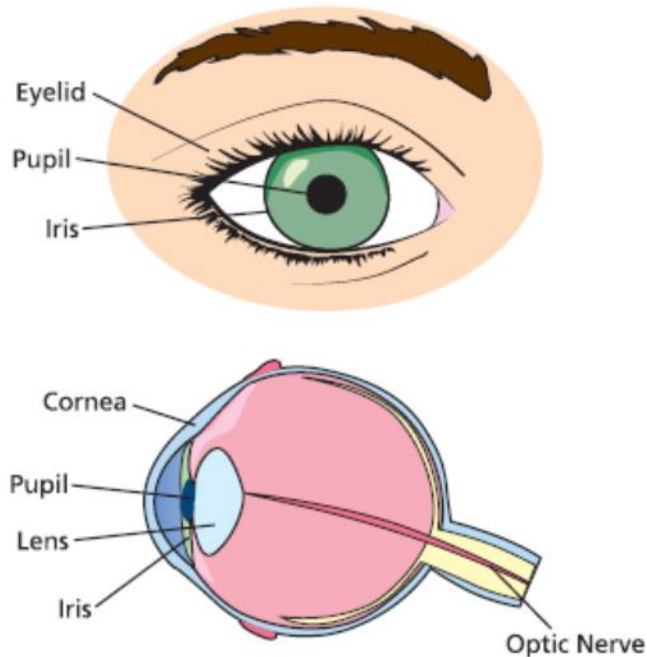
Stimulus

Tom and Vicky are playing “fetch” with their dog one evening. Tom or Vicky throw the ball, and the dog brings it back to them to throw it again. Their dog wants to keep playing even after dark.

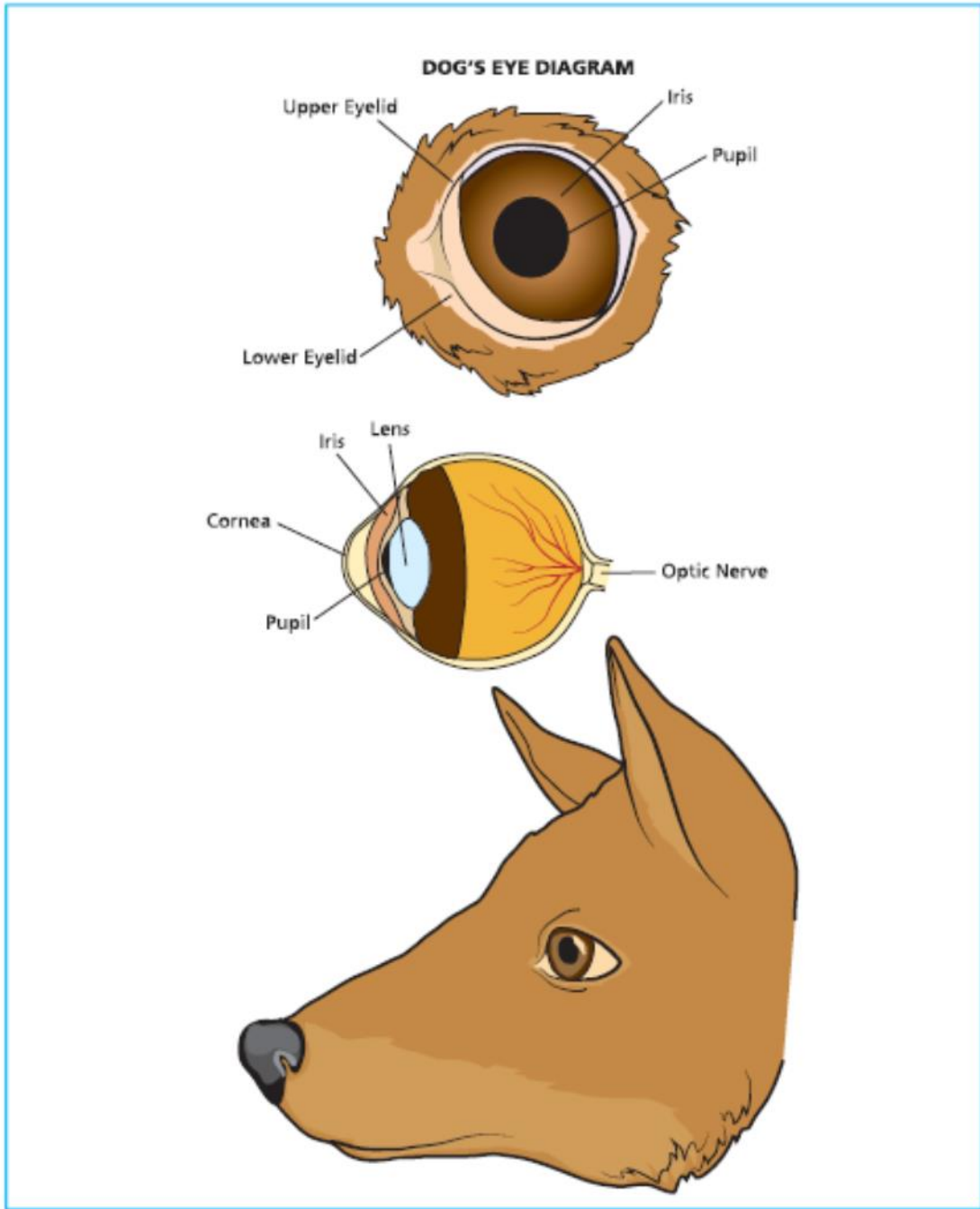
After it is dark, the dog is still able to find the ball and bring it back. Tom and Vicky research dogs’ senses to determine how the dog finds the ball.

Their research indicates that dogs’ eyes are similar to human eyes, but that dogs have better night vision. Both dogs and humans have a cornea that gathers light and a lens that focuses the light.

HUMAN EYE DIAGRAM



Stimulus



Stimulus

In science class, Tom and Vicky look at diagrams of a dog's eye in bright light and dim light. They are talking about the reason that the pupil of a dog's eye might get larger in dim light.

Dim Light



Bright Light



Tom and Vicky want to see if human eyes work the same way dog eyes do under dark and light conditions. Vicky sits in different locations, some of which are dark and some of which are bright. She sits in each location for a few minutes to let her eyes adjust to the light. Tom draws an image of her eyes while she sits in each location. Tom tells Vicky that her eyes look different in different light conditions.

Stimulus

Tom and Vicky read about senses other than sight that their dog may use to find the ball in the dark.

Tom and Vicky's research shows that dogs use their sense of smell to understand their environment. A dog also uses much more of its brain to control its sense of smell than a human brain does: A dog's sense of smell is from 1 million to 100 million times stronger than a human's sense of smell.

In addition to its sense of smell, a dog's hearing allows the dog to hear sounds that are about four times farther away than a human's weaker hearing can detect. Dogs also have more muscles in their ears than humans. Dogs can move their ears toward sounds. Finally, dogs can hear high-pitched sounds humans can't hear.

It starts getting dark, and Tom and Vicky start having trouble locating the ball. Tom said, "Wait a minute, Vicky. I will go inside and get a flashlight." Once he brings the flashlight, they are able to find the ball easily.

Tom and Vicky talk with their teacher, and their teacher tells them that dogs can sense when people have certain diseases. They ask how this is possible.

The next day, Tom and Vicky go outside to play with their dog. Their dog gets excited when she sees the ball they use to play with. She wags her tail and jumps up and down.

Prompt

8

Explain why Tom and Vicky's dog starts wagging her tail and jumping around when she sees the ball Tom and Vicky use to play the game "fetch." Be sure to include the senses the dog uses and the information the dog receives from those senses.

Kentucky Academic Standards Science Rubric

Score	Description
<p align="center">4</p>	<p>There is evidence in this response that the student has a complete and thorough understanding of the multi-dimensional question as evidenced by their explanation of the phenomenon and/or solution to the problem.</p> <p>The response is complete, thorough and correct and based on appropriate knowledge and skills The response does not contain errors or flaws in logical thinking or those flaws are irrelevant to the accuracy of the answer The response reflects complete synthesis and understanding of complex ideas The response is completely coherent and based on effective application of relevant dimensions (SEP and/or DCI and/or CC) The response integrates a solution that is completely correct and based on the principles of engineering design (if applicable)</p>
<p align="center">3</p>	<p>There is evidence in this response that the student has a general understanding of the multi-dimensional question as evidenced by their explanation of the phenomenon and/or solution to the problem.</p> <p>The response is generally complete and the question is answered using appropriate knowledge and skills The response may contain minor errors or flaws in logical thinking and those flaws may or may not be irrelevant to the accuracy of the answer The response reflects a general synthesis and understanding of complex ideas The response is generally coherent and based on application of relevant dimensions (SEP and/or DCI and/or CC) The response integrates a solution that is generally correct and mostly based on the principles of engineering design (if applicable).</p>
<p align="center">2</p>	<p>There is evidence in this response that the student has a limited understanding of the multi-dimensional question as evidenced by their explanation of the phenomenon and/or solution to the problem.</p> <p>The response is partially complete and/or the question is answered using limited understanding of knowledge and skills The response may contain significant errors or flaws in logical thinking The response reflects a limited synthesis and understanding of complex ideas The response may or may not be coherent and based on some application of relevant dimensions (SEP and/or DCI and/or CC) The response integrates a solution that is partly correct and may or may not be based on the principles of engineering design (if applicable).</p>
<p align="center">1</p>	<p>There is evidence in this response that the student has a minimal understanding of the multi-dimensional question as evidenced by their explanation of the phenomenon and/or solution to the problem.</p> <p>The response is minimal and/or the question is answered using minimal understanding of knowledge and skills The response may contain major significant errors or flaws in logical thinking The response reflects a minimal synthesis and understanding of complex ideas The response is not coherent or is not based on application of relevant dimensions (SEP and/or DCI and/or CC) The response integrates a solution that is minimally correct and may or may not be based on the principles of engineering design (if applicable).</p>
<p align="center">0</p>	<p>There is no evidence that the student has an understanding of the material related to the question being asked in terms of science content and logical thinking skills. The response is blank, entirely incorrect and/or irrelevant.</p>

16

The dog is use to playing with that ball.

16

Tom + Vicky's dog starts wagging
its tail because she is happy.
The dog is happy because
she knows the ball and she
loves it.

16

Their dog is wagging its tail
and jumping up and down
because she is excited and
the dog senses the ball.

16

The dog starts wagging her tail and jumping around because she might remember the smell of her ball and want to play

8

He gets excited because he can hear them talk so say if Vicky said "Do you want to play fetch?" he could hear her say that & so that's why he got excited.

16

The dog starts wagging its tail and
jumping around because it remembers
when they use to play fetch so when
when he goes his eyesight to
see the ball he knows that
he wants to play fetch.

8

Tom and Vickys dog wags her tail because the dog can hear the ball after it lands and uses her sense of smell. By hearing where the ball lands she/he can find the ball quicker. With her/his sense of smell she/he can smell where the ball is even if it's in the daytime or nighttime. Another reason their dog gets excited is because he/she enjoys playing fetch with Tom and Vickys.

16

Tom and Vicky's dog starts wagging their tail when they see the ball because it knows that they are going outside to play. He knows that because he senses that because he's gotten used to it. He also receives that because his eyes it allows him to see the ball and travel it to his brain for him to know what it is.

8

The dog starts to jump and wag because the dog can smell the ball and the smell of the ball is familiar to ~~the~~ and the dog has seen the ball before so when ~~the~~ dog saw the ball he remembered what it was. Also if the ball made a sound when Tom and Vicky brought it out he could recognize the sound. These are some reasons why the dog jumped and wagged its tail.

16

A. I think the dog gets happy because he can use his smelling which is one million to one hundred million times stronger to a human's to smell the ball and realizes it's his smell. He will also use his eyesight to see that that's the ball they always use to play fetch. His smelling also helps because he knows his smell of slobber is on the ball. He also knows his environment so he knows that when they come outside that they usually play fetch.

16

The dog gets excited because she loves to play fetch. When she sees the ball, it goes through the cornea, iris, pupil, lens, and finally the optic nerve. The optic nerve sends a signal to the brain then it remembers "oh a fetch ball let's play fetch." Or she can smell the slobber on the ball because dogs have way better smelling than we do. Last they have better hearing. So it must be heard then come outside and looked at them and sensed them.

8

Tom and Vicky's dog uses its senses when it sees the ball and gets excited because the ball is familiar to the dog. The dog uses its sense of sight to see the ball in the distance. Its eyes adjust to its environment and the type of light it is in. Another sense it uses is smell. It uses smell to understand the environment around him. Dogs have a stronger sense of smell than humans and use their brains to control its sense of smell. The dog can use its sense of smell to smell its owner's scent on the ball and causes it to get excited.

8

Tom and Vicky's dog thumps up and down and is wagging her tail for many reasons. First of all, the dog has a keen sense of smell. The text states, "A dog's sense of smell is from 3 million to 300 million times stronger than a human's sense of smell." The dog picked up its scent and the scent of the same dog and remembered how fun it is. Furthermore, the dog uses its brain to remember the ball. The text states, "A dog also uses much more of its brain to control its sense of smell than a human brain does." That shows the dog used its brain to remember the scent of the ball. Those are two ways the dog wagged its tail and thumped around.

8

I think that Vicky's dog starts wagging her tail and jumping up and down because she can see that the ball is in Tom and Vicky's hands and wants to play a game of fetch with her owners. I also think that the dog can smell the ball because when a dog fetches a ball they carry it in their mouths. And a dog, which has a strong sense of smell, can most likely smell their own saliva on the ball. Vicky's dog would receive the information that they have used the ball before by the smell of their saliva and can see that this ball is the one that they used the previous night and register that she gets to play fetch again. Vicky's dog must like the game fetch and is excited to play it again so some of her reactions are wagging her tail and jumping up and down.

This page was intentionally left blank. Responses at this score point level are currently unavailable.