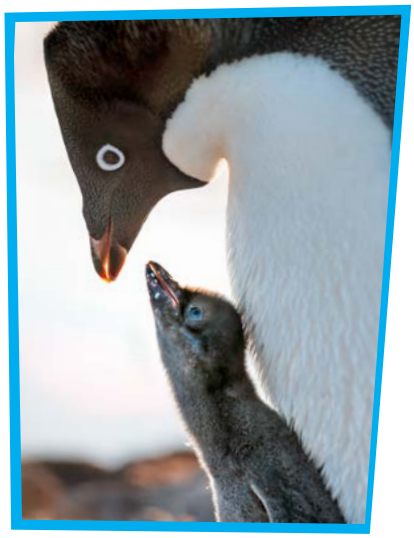
1 Adélie Penguin Family Life Cycle

Each year, Adélie penguins are capable of migrating nearly 11,000 mi (17702 km) to reach their breeding colony. They begin the breeding process at the start of the spring season — spring begins at the end of September and runs through the end of December in Antarctica. During this time, male Adélie penguins will arrive to the rookery or nesting colony first and start to construct a nest for their potential chicks. Antarctica is covered in ice, so finding traditional nest-building items like twigs, leaves, seedpods or cones is impossible in this region. The Adélie penguins must use a different method — rocks and pebbles! Nest-building is one way male Adélie penguins try to attract and find a female mate. They will even attempt to steal "better" stones from other nests in order to impress their potential mate.

Once the female Adélie penguins have arrived to the breeding **colony**, they will pair up with their former mates from previous years. That's right, Adélie penguins mate with one partner for life. By performing unique **vocalizations** and displays, previous mates are able to locate one another among the thousands of other Adélie penguins in the breeding colony. Female Adélie penguins typically lay two eggs in their nest and both parents work hard to keep those eggs warm and safe – they will take turns sitting on the eggs, keeping them warm and safe from **predators**. While in this **incubation stage**, the eggs are at risk of being snatched from their nest by polar skuas, large birds that inhabit the region. The south polar skuas typically eat only fish and **krill**; however, during the Adélie penguin breeding seasons, they will prey on the Adélie eggs and young. After about 30 days, those baby Adélie penguins will begin to break out of their protective eggs and learn how to be a penguin themselves! However, their parents' work isn't done quite yet. During this guarding stage, mom and dad will alternate **foraging**, feeding and protecting their chicks for up to four weeks after hatching. The following few weeks of the chicks' lives will be spent in a **creche** — a group of young Adélie penguins — for added protection while mom and dad both search for food. An Adélie chick spends about 55 days in the creche. During that time, they will begin to replace their down feather coats with waterproof feathers. Once the chicks have their waterproof feathers, they're ready to **fledge** and enter the water. While in the water, Adélie penguins must watch out for their biggest predator — leopard seals. Leopard seals have a long, slender body that is designed for speed. Males are slightly smaller than females and both will feed on almost anything (penguins, fish, squid).

Typically, right after breeding season, penguins will go through a process called **molting**, where they will shed their feathers. Throughout the year, a penguin's feathers become worn through natural events like rubbing against other penguins, going in and out of the water or coming in contact with the ground. Because of this, most penguins will completely shed their feathers once a year. During this time, about two weeks for an Adélie penguin, they must stay out of the water because their new plumage is not yet waterproof. Upon completion of each breeding season and molt, adult Adélie penguins will disperse into the coastal waters to feed and the migration process will start all over again.



Disney nature PENGUINS

Grades **2-3** | Content Areas **ELA, Art & Science**

Family Life Cycle Story Stones

ESSENTIAL QUESTION

What are Adélie penguin parents' responsibilities as they raise their chicks from "nest to empty nest?"

Materials

- seven smooth stones per student or small group
- black permanent markers and white chalk paint pens, or acrylic paints and paint brushes
- pencils
- paper
- *Activity Sheet: Sketching Penguin Pictographs*

Vocabulary

- creche-stage
- fledglings
- guard-stage
- incubation
- molting

Process

Making story stones helps students review members of Adélie penguin family units. Using the stones to retell life events in order reinforces the roles parents play in a cycle of feeding and protecting chicks from "nest to empty nest."

WARM UP

Ask students to discuss something new they tried and the challenges they faced. Ask students to imagine how difficult it is for first time parents, like Steve in Disneynature **Penguins**, to figure out parenting stages from "nest to empty nest."

MAKING STORY STONES

Direct individuals or small groups to complete *Activity Sheet: Sketching Penguin Pictographs* to make a set of seven story stones. Explain that story stones are a collection of small painted stones that can be used as prompts for telling a story. Display Adélie penguin photos as the class discusses the Disneynature **Penguins** characters, things in the penguins' environment and events. Instruct students to paint each stone with markers, paint pens or acrylics depending on the stone color.

WRAP UP

Instruct students to take turns in small groups arranging story stones into a circle to retell Steve's family life cycle story. Students may also step into the flippers of one of the family members and use the stones to tell their own story. Discuss together how they felt during each stage, what did they wonder about and what new things did they have to figure out?

Note

"Take a Turn" stories allow each student to pick a stone from an array, tell part of the story, and collaborate on the ending.

Disneynature PENGUINS

Activity
GRADES 2-3

SKETCHING PENGUIN PICTOGRAPHS

NAME _____ DATE _____

Directions: Choose 7 items from the lists below to sketch on your story stones.

Characters

- Mother penguin
- Chick #1
- Father penguin
- Predators
- Chick #2
- Other?

Actions

- Swimming
- Sliding on belly
- Diving into water
- Walking
- Eating
- Leaping out of water

Things

- Nest
- Ocean waves
- Pebbles
- Krill
- Other?

Grades **2-3** | Content Area **Art**

Penguin Paper Mosaic

ESSENTIAL QUESTION

How is combining paper tiles on a mosaic to form an image similar to the process Adélie penguins use to combine pebbles to form a nest?

Materials

- 8x10 inch blue card stock
- pencils
- recycled construction paper (black, white, orange, dark blue)
- scissors
- glue sticks
- acrylic sealer

Vocabulary

- mosaic
- tiles

WARM UP

Ask students to imagine they are an Adélie penguin who is making a pebble nest for the first time. Tell them, as a penguin, you need to select pebbles that won't crumble when you pick them up with your beak. You would also carry each pebble to the nesting site to arrange large and small pebbles into a sturdy nest. Like solving a jigsaw puzzle, making an Adélie penguin nest, or making a **mosaic**, involves taking smaller objects, like **tiles**, glass, paper or rocks, and assembling them into a larger image.

MAKING A PAPER MOSAIC

Remind students that a mosaic is like making a nest, or a jigsaw puzzle — all of the little pieces fit together to make something larger. Instruct students to follow the steps below to create their own paper mosaic.

a) Draw the outline of an Adélie penguin on blue card stock.

b) Make mosaic tiles by cutting out black and white construction paper the size of thumbnails.

c) Use a glue stick to fix paper tiles around the edge of the outline.

d) Fill in the middle with the other tiles.

e) Complete the face with black circles, white circles and an orange triangle.

f) Fill in the background design.

g) Dry and then apply acrylic sealer.

WRAP UP

Discuss as a class: What is a mosaic? Ask students the following discussion questions.

a) What did you notice about the paper when you tried to put them together?

b) How did you make your image stand out?

c) How did you use color, shape, texture, or pattern?

d) What was your favorite part of creating this artwork?

e) How easy or hard was it for Steve to make the nest?

f) How is making a mosaic like the process of using pebbles to make a nest?

Challenge

Some students may enjoy tearing construction paper into shapes of feathers. In this case, suggest students start at the bottom of the mosaic, applying glue to the tops of the paper feathers only. Then layer the feathers in ways that cover all parts and follow the body contours. Carefully seal the finished artwork with acrylic sealer by stroking the brush from top to bottom.

Disney nature PENGUINS

Grades **4-6** | Content Areas **ELA, Art & Science**

Family Life Cycle Story Cups

ESSENTIAL QUESTIONS

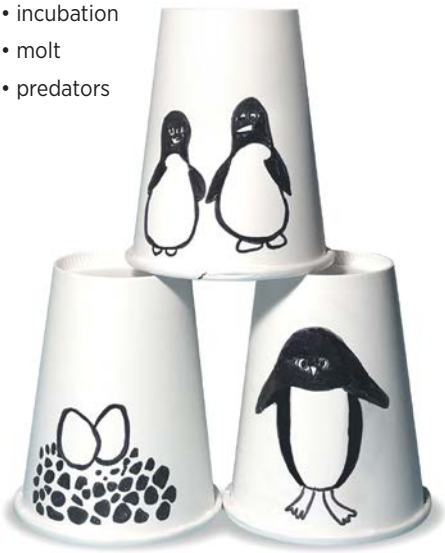
What are Adélie Penguin parents' responsibilities as they raise their chicks? What are the stages of the family life cycle?

Materials

- seven white, paper, drinking cups per student or small groups of students
- black permanent markers
- pencils
- *Activity Sheet: Match & Sketch*

Vocabulary

- creche-stage
- fledgling
- forage
- krill
- guard-stage
- incubation
- molt
- predators



Process

Making story cups helps students review members of Adélie penguin family units. Using the cups to retell life events in order reinforces the roles parents play in a cycle of feeding and protecting chicks from "nest to empty nest."

WARM UP

Invite students to think about and discuss something they did for the first time that wasn't very easy. Discuss how the family life of Adélie penguins begins anew each year. Ask students to imagine how difficult it is for first time parents, like Steve in Disneynature **Penguins**. Share with the class that they will learn about parenting stages that range from "nest to empty nest."

FAMILY LIFE CYCLE

Ask individual students or small groups to complete *Activity Sheet: Match & Sketch*. Students will follow directions to create a set of seven stacking cups. Display photos of Adélie penguins as the class discusses the roles family members play during each stage of the family life cycle: migration, nest building, mating, **incubation**, **guard-stage**, **creche-stage**, **fledgling** and adult post **molt**.

STORY TELLING

Students in small groups take turns selecting and arranging sets of cups in a circle to retell Steve's family cycle story from migration to empty nest. Students take the point of view of one family member — male, female or hatchling — and describe how they felt, what they learned, etc. at different stages of the cycle.

WRAP UP

Students discuss Adélie penguin parent responsibilities as they raise their chicks. At which stages did the parents need to feed themselves or feed the chicks? Discuss how the family cycle begins anew each year and what challenges that might pose for the penguin families.

Note

Remind students to use signal words for retelling, such as first, second, next, then, after, following, finally, soon, now and/or before.

Disneynature PENGUINS

Activity
GRADES 4-6

MATCH & SKETCH

NAME _____ DATE _____

Directions: Draw a line from the life event to the matching action.

LIFE EVENT	ACTION
Male Penguin Arrives	Mrs. Penguin lays two eggs and she and Steve take turns foraging for food.
Female Penguin Arrives	Chicks forage. Parents no longer feed or protect fledglings who learn to swim.
Incubation Stage	Chicks congregate into large groups. Parents forage further away.
Guard-stage	Steve collects pebbles and builds a nest.
Creche-stage	Chicks hatch and grow. Mrs. Penguin and Steve take turns foraging, feeding and protecting chicks from predators.
Fledgling Molt	Mrs. Penguin and Steve meet.

Make a set of 7 stacking cups: Use the spaces below to draw thumbnail sketches for each cup.

Cup 1: STEVE

Cup 2: PEBBLE NEST

Cup 3: MRS. PENGUIN

Cup 4: NEST WITH TWO EGGS

Cup 5: NEST WITH TWO EGGS EVE

Cup 6: 2 MOLTING CHICKS

Cup 7: STEVE AND CHICKS ON WAVES

Disney nature PENGUINS

Grades **4-6** | Content Area **Art**

Penguin Pebble Mosaic

ESSENTIAL QUESTION

How is combining pebbles on a mosaic to form an image similar to the process Adélie penguins use to combine pebbles to form a nest?

Materials

- non-toxic water-based glue
- 11x15 inch watercolor paper
- 11x15 inch cardboard or other sturdy material for backing
- black permanent markers
- pencils
- newsprint
- tracing paper
- found or purchased rocks/pebbles
- paint (optional)

Vocabulary

- mosaic
- mosaic tiles

WARM UP

Ask students to imagine they are an Adélie penguin making a pebble nest for the first time. Describe and discuss the process such as selecting pebbles that won't crush when you pick them up with your beak, carrying each pebble to the nesting site and arranging large and small pebbles into a sturdy nest. Explain that, like solving a jigsaw puzzle, making an Adélie penguin nest, or making a mosaic, involves taking smaller objects, like tiles, glass, paper or rocks and assembling them into a larger image.

PREPARE YOUR MOSAIC TEMPLATE

Request students adhere to the following directions.

a) sketch 3 mosaic ideas on newsprint.

b) use tracing paper to copy their favorite design.

c) flip the tracing paper over and trace the lines with a pencil.

d) glue the watercolor paper to the backing.

e) place tracing paper pencil side down on the watercolor paper (as students trace over the lines, the pencil graphite transfers the image to the watercolor paper).

f) use a black permanent maker to trace over the pencil marks on the watercolor to create the mosaic pattern.

CREATE YOUR MOSAIC

Share the following directions with your students.

a) select rocks to be used or painted.

b) paint or wash, then dry the rocks.

c) arrange the rocks to fill in the image and background pattern .

d) lift each rock, put glue on the bottom, reposition and allow the mosaic to dry.

WRAP UP

Discuss the following questions as a group.

a) What is a mosaic?

b) What did students notice about the pebbles when they tried to put them together?

c) How did students make their image stand out and how did they use color, shape, texture or pattern?

d) What was your class's favorite part of creating this artwork?

e) How easy or hard do your students think it was it for Steve to make his nest and how is combining pebbles on a mosaic to form an image similar to the process Adélie penguins use to combine pebbles to form a nest?

Disney nature PENGUINS

Extension for Grades **4-6** | Content Areas **Music & Science**

Find Your Family
The Adélie Penguin Way

ESSENTIAL QUESTION

How do family members use unique calls and vocalizations to find each other?

Materials

- game cards (4 hearts, 4 diamonds, 4 spades, 4 clubs)

Vocabulary

- calls
- colony
- vocalization

Note

Game vocalizations are based on a 4/4 time signature - four steady, evenly spaced beats. To start, clap hands evenly on every beat (1, 2, 3, 4) and repeat the pattern.

Process

By stepping into the flippers of an Adélie penguin, students will experience the communication skill of using unique **vocalizations** to identify their penguin mom, dad and chicks within a larger **colony** through play.

WARM UP

Many people use a Global Positioning System (GPS) to find a specific location. One way Adélie penguin families locate each other is with a made-up game name that we will call a PFLS — Penguin Family Locating System — where they will make and listen for unique **calls**. After students listen to a recording of a **colony** of thousands of penguins, ask them to try to distinguish one **vocalization** from another. Discuss if and how that might be challenging.

FINDING YOUR FAMILY

a) Practice clapping in 4/4 time until the class maintains a steady beat.

b) Request that 16 students select and keep secret a game card. Help students figure out their PFLS vocalization. Explain, if a student has a heart card, their call will be "La - La - Clap - Clap." If a student has a diamond card, their call will be "La - La - La - La," and so on. Students with no card will clap to the beat.

c) All students spread out, so they can't touch anyone. They take one step for each beat, making their vocalizations, and listening for students with their pattern.

d) Students cluster into family groups of four. After all groups are formed, the winners are the first 3 groups to assemble.

e) Repeat the game to see if students improve and give students a chance to choose a card they might not have had in the previous round.

WRAP UP

Discuss the ease or difficulty involved in locating the small group of family members from the larger group. How did using unique vocalizations help or hinder their search?

Disney nature PENGUINS

Extension for Grades **4-6** | Content Area **Math**

Nests Take Shape
Platonic Solids

ESSENTIAL QUESTIONS

What are the platonic solids? If platonic solids shapes were pebbles, which ones would make the best Adélie penguin nest and why?

Materials

- 3 tennis balls per small group
- *Activity Sheet: Chart for Recording Faces, Vertices (Points) and Edges*
- set of polyhedral dice
- pencils
- rulers
- card stock
- scissors
- *Activity Sheet: Platonic Solids Nets*

Vocabulary

- regular tetrahedron
- cube
- octahedron
- dodecagon
- icosahedron
- sphere
- platonic solids
- radius
- face shape
- net

WARM UP

Tell students it takes hundreds of pebbles to build a nest. Pebbles keep eggs off the ground and avoid melting snow. Remind students how the pebbles Steve used either stayed in place or rolled away. Let's figure out which shapes would make the best nest.

SHAPE EXPLORATION

a) Ask students to gather into groups of three or four and give each group a **regular tetrahedron** die, a **cube** die, an **octahedron** die and a **sphere** (tennis ball). Ask groups to compare shapes and discuss which shapes are the **faces** of each solid?

b) Ask each group to fill in *Activity Sheet: Chart for Recording Faces, Vertices (Points) and Edges* together.

c) Instruct groups to discuss if the pebbles were made out of the **platonic solids**, which shapes, would make the best nest and why?

d) Give each group a set of **nets** to make three platonic solids. Students then cut out, fold and tape the edges.

e) Collect the platonic solids and split the class into four even groups.

f) Give one type of solid to each group and challenge them to make as big a nest as possible.

g) Ask groups to measure, then compare their biggest nests with others. Discuss how high each nest was, how wide, how comfortable it would be for a penguin and if it would hold two penguin eggs safely.

WRAP UP

Introduce the **dodecagon** and **icosahedron**. Note face shape, number of faces, number of vertices and number of edges together as a class. Discuss how these two solids might work as nest building rocks. Ask students what properties in a rock shape and texture might the penguins search for in order to make their nest.

Platonic Solids Quick Reference

Regular Tetrahedron: 4 equilateral triangles

Cube: 6 squares

Octahedron: 8 equilateral triangles

Dodecagon: 12 regular pentagons

Icosahedron: 20 equilateral triangles

Note

Scientific Research Study Findings!

Scientists completing a research study on Adélie penguin nests discovered the quality of the nest depends on compactness and form. Highest quality nests had a radius of only 18 cm and a rim height of 2 cm!

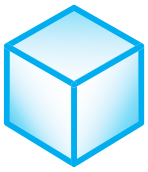
Disney nature PENGUINS

Activity
GRADES
4-6

CHART FOR RECORDING FACES, VERTICES (POINTS) AND EDGES

NAME _____ DATE _____

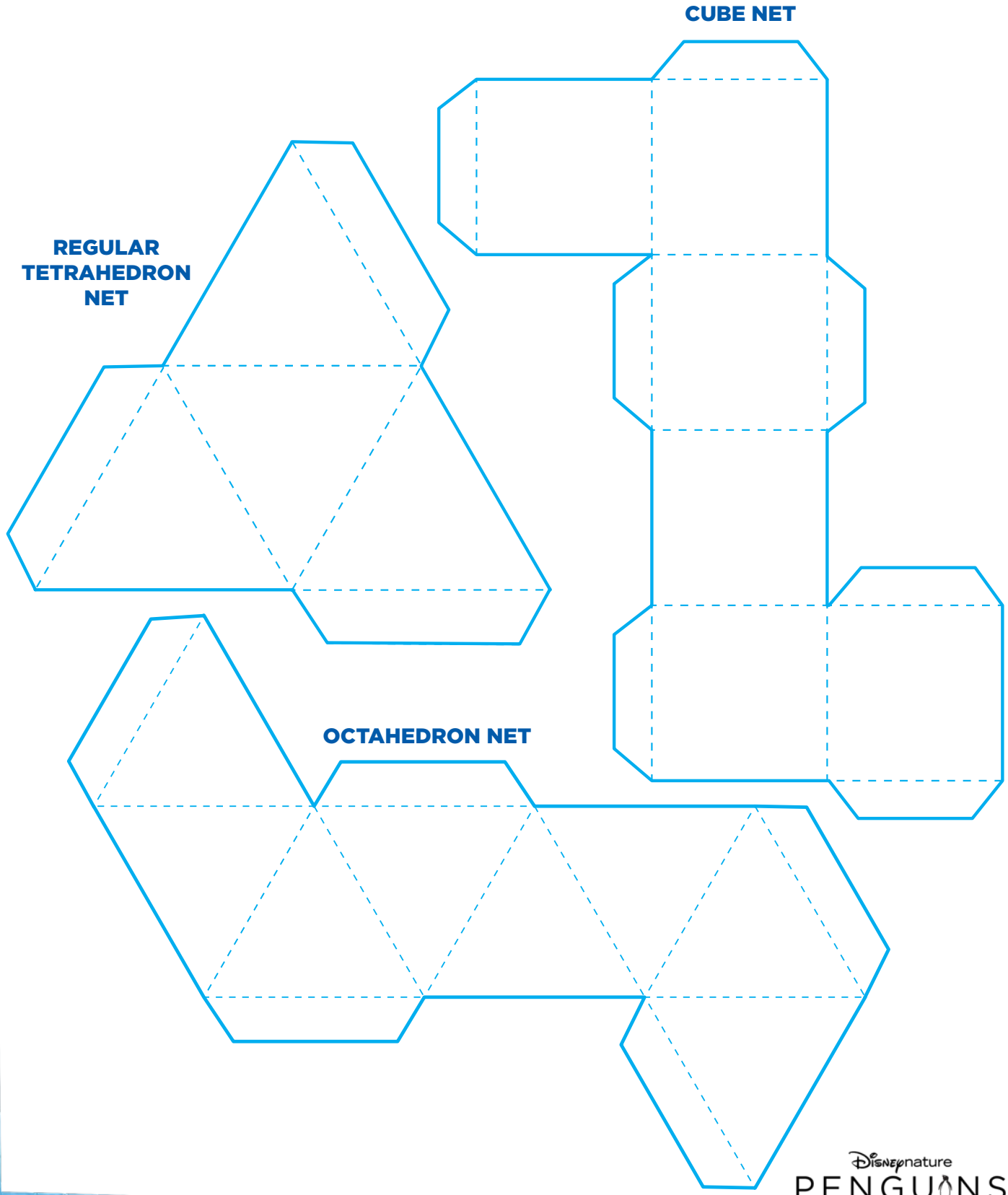
Directions: Chart the number of faces, vertices (points) and edges.

	Number of faces	Number of vertices	Number of edges
 **Tetrahedron** FACE SHAPE _____			
 **Cube** FACE SHAPE _____			
 **Octahedron** FACE SHAPE _____			
 **Sphere** FACE SHAPE _____			

Activity

GRADES 4-6

PLATONIC SOLIDS NETS



Disney nature PENGUINS