For Kids Who Love Nature Winter 2018 -Winter 2018 Kunter 2018 Kunter 2018 Kunter 2018

> Who do I belong to?

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INSIDE ...

WHERE THERE'S SNOW DR. DOOWITT WHAT IS A SNOWFLAKE? BUG GIRL ZOMBIE WORMS WORD SEAR(H READ ALOUD STORY ASK AL DR. DOOWITT FOLLOW UP NATUREWILD NEWS MATCH THE FOOTPRINTS

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Greetings, Nature KIDS! We hope you enjoy this new issue of NatureWILD.

This is the gift giving time of year - how about giving a subscription to NatureWILD to a nature-loving friend or cousin? Perhaps someone who does not live in BC?

A subscription is only \$20 for 4 issues a year starting any time. Go to our website www.naturekidsbc.ca and click on Membership. There you will find how to order a subscription. Or email Niki at info@naturekidsbc.ca and she'll tell you what you need to do.

Best wishes for a happy holiday season from all of us at NatureWILD -Alison, Brian, Daphne, Kristine, Tricia and Al Grass







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NatureKIDS BC is **THE** club for children and families who love to be outdoors. Members discover nature on Explorer Days organized by volunteer leaders and guided by experts, participate in stewardship projects, earn Action Awards and receive **NATUREWILD** magazine 4 times a year.

Come join us! Family membership: **\$35** per year. Individual adult membership: \$25 per year. Or subscribe to NATUREWILD magazine: \$20 for 4 issues per year. For more information and to sign up online go to: naturekidsbc.ca

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Where There's Snow, There's Life.

Yes - there really is life in, on and under the snow.

On the snow

You need sharp eyes to spot some of these creatures and a hand lens to see them properly. You might see what looks like bits of pepper on the snow, except they are hopping about. These are 'snow fleas' – not actually fleas but tiny little springtails. They may be feeding on 'watermelon snow' – snow that has turned pink from the algae that is growing on its surface. Because the pink snow gathers in more light than the reflective white snow around it, it gets a little warmer as the water melts. This results in snow with 15 -20 cm pink dimples that indicate where these concentrations of algae are.

Snow scorpionflies (which look like tiny grasshoppers) and **snow spiders** both go hunting on and under the snow for snow fleas to eat.



Snow spider hunting

Taking the photo startled the snow fleas so they started jumping around and some slipped on the ice crystals.

Under the snow

Packed snow acts as a blanket, keeping little animals that live in the grassland below quite cosy and warm. The warmth comes from deep within the earth and is trapped beneath the snow. This heat melts the lowest layer of snow and makes a space where mice, voles and shrews can move about. They make a network of tunnels so they can roam around, finding grass seeds and insect eggs to eat, hidden from predators such as Snowy Owls, hawks and coyotes.





Whenever the weather brings snow, I like to catch snowflakes on my tongue. For a real treat I catch them and look at them! The best temperatures for beautiful six-sided snowflakes are from -2° Celsius down to about -12°Celsius. So, if the temperature drops below freezing and it's snowing, I get outside with my snowflake inspection kit!

Dr. Dootulitt Gatehas a

In my kit I have a magnifying glass and a black Styrofoam food tray for the snowflakes to land on. I like using the Styrofoam tray as it is stronger and easy to work with when I have mittens on.

(Speaking of mittens, the thicker, fuzzier and darker the better, as snowflakes will settle on them and the heat from your hand won't get through to melt them.)



I keep my kit in a plastic bag in the freezer so it is easy to find and quick to move outside. Freezers are about -13°Celsius or colder which is just right. You don't want to melt your snowflakes when you catch them! Of course, if the weather is cold enough you can leave the kit outside under cover.

As soon as I am bundled up in my cold weather gear I grab my kit and quickly head outside to begin collecting flakes. I find a place out of the wind where they are floating down slowly and hold out my tray to let flakes land gently upon it. When there are a few on the tray I bring the magnifying glass close to the flake but not too close as the heat from my face or my breath will melt the delicate flakes in an instant. However, if that happens I just catch some others!

How many different shapes can you find and sketch in your notebook? Keep track of the date and the outside temperature for each flake you draw. Why? See the next page.

what is a show flake? Be a snow flake scientist!

By Tricia Edgar

When it gets cold, water changes into its solid state – ice! Some ice is large like the ice that covers lakes in the winter. Other ice is really small. A snowflake is a tiny, feathery ice crystal.

Snowflakes are made when cold water freezes around a little particle in the sky. This could be pollen or dust. The icy water starts freezing and falling, and as it falls more parts of the flake take shape. Each snowflake moves down a slightly different path through different clouds, and this helps make its own special shape.

The shape of a snowflake depends on the temperature and humidity that are around it when it forms. A snowflake usually looks like a six-pointed star. The reason snowflakes have six points is that the best

way for ice crystals to join together is in a hexagon.

Snowflakes do not always look like the ones we cut out of paper. At different temperatures they take different

shapes. Between -5 and -10° C they form hollow columns and needles of ice. When it is quite cold (below -25°C), they form columns and



plates. The six-point snowflakes form just below zero and from -10 to -20°C. That means that when you look at a snowflake, the shape gives you a clue about how cold it was where it formed.





by Cynilhia Heinrichs (Based on a true story)

Emma held the grasshopper in the palm of her hand. She was very gentle so he wouldn't hop away. She just wanted to get a good look at his rear legs. They were much longer than his other four legs. They stuck up high above his back, knees bent, and ended in tiny feet. Emma knew those delicate-looking legs were very strong.

Emma loved bugs - all of them. Ants, caterpillars, ladybugs, millipedes, pill bugs, even big hairy spiders. And of course, grasshoppers. Other kids thought she was weird. A girl who liked bugs!

"You're amazing," Emma said to the grasshopper, "and beautiful."

"Bug Girl!" yelled a voice behind her.

"Oh, no! That's Ricky. You'd better go. It's not safe here."

She moved her hand, and with his powerful legs the grasshopper SPRANG into the air. His wings unfolded as he zigzagged into the salmonberry bushes, to safety.

"Bug Girl! Bug Girl!" More voices were yelling.

LaDyBug

Emma hurried down the sidewalk. She wished she could fly too. She would fly to a school where the kids loved insects as much as she did instead of stepping on them. She would fly to a school where, when they called her Bug Girl, it was a good name.

But she couldn't fly and her mother had said they couldn't move away. So, a little while ago, Emma had begun to hide her interest in insects. She hoped that if the other kids thought she didn't care about insects



anymore, they would stop picking on her and her many-legged friends.

She had done a good job over the winter, but today, when she saw the grasshopper, she just had to get a closer look at him. She hoped he was safe, that Ricky and the others hadn't found him and hurt him.

When Emma got home, she told her mother what had happened.

"You can't give up on insects," said her mother. "You love them."



Grasshopper

CaterPillar

"I have to," said Emma sadly. "Maybe then the kids will leave me alone."

Her mother knew that Emma could never be happy without insects in her life. That night she wrote a letter to the Entomological **Society of Canada asking for a pen pal for Emma, someone who shared her love of insects.

A week later Emma came home to a surprise. An entomologist called Michael had received her mother's letter and posted a picture of it online.

He asked for volunteers to support Emma. And many people volunteered.

Dozens of them. Hundreds of them.

"All these people love insects," said her mother.

"Wow!" said Emma. "There are so many of them!"

She felt so happy. She felt as if she had hopped up and flown away from all the sadness and bullying at school.

Over time thousands of people volunteered to help Emma. The newspapers wrote

about it. Emma was famous! Everyone was talking about insects and how she loved them.

The kids at school still called her Bug Girl, especially Ricky, but it didn't bother her now. She knew there were other people who also loved insects and found them fascinating and amazing. Many of these people worked with insects as their job. Maybe she could work with insects too.

Some people studied how using social media can help users understand how people like Emma are not weirdos but can become valuable researchers or inventors. Emma's teacher told her class about the study, and how Emma's name was in it.

"Emma got the help she needed from other people," said the teacher. "But maybe she can get help here, too. Our next unit will be on insects. I think we have an expert in our classroom."

> Walking home from school that day Emma heard someone run up behind her. She turned around. It was Ricky.

> > "You really are the Bug Girl," said Ricky. He said it like it wasn't such a bad thing.

Emma smiled proudly. "I sure am."



Emma has found a spider living in a log

Photo credits: caterpillar & Ants: Rob Alexander, B.C. • Pillbug: Fractality, CC • Spider & Emma: Louise Pedersen, B.C. • Background: Konstanttin, istockphotos.com



Spider on a log





** Entomology means 'study

of insects'.

CONTROLEMENTS OF CONTRO

It sounds like a classic horror movie – eyeless, mouthless worms lurking in the dark, settling onto dead animals and sending out green roots to devour their bones!!! YIKES! SCARY!!

Actually, Zombie worms are not really all that scary BUT they DO EAT BONES and those bones are generally whale bones. How does that work?

Zombie worms are **polychaetes** (bristle worms) and belong to the Genus **Osedax** (os = bone; edax = devouring), so you can call them bone-eating worms.

Rattail

Marine snails



Bristle worm

Whales are huge (approximately 10 to 20 metres long and 100-200 tonnes in weight) while Zombie worms are only about the length of your finger - 5 centimetres. Surely it must be that whales are eating the Zombie worms? No, it is indeed the other way around.

Zombie worm larvae live and drift as they search for a special habitat at the bottom of the ocean called a whale fall. When an adult whale dies its body sinks from the surface of the ocean - where it used to it is the bottom of the ocean. In the deep ocean there is little for animals to eat so a whale fall is an important supply of food - thousands and thousands of kilograms to be used as food by hungry creatures.

After the whale's body has landed on the ocean floor. hundreds of animals get to work eating it. First, the large swimming scavengers like sharks, rattails and hagfishes move in to rip and tear at the whale's flesh to expose the oily blubber. Once the flesh is torn apart, small scavengers swarm in and soon the whale body is stripped almost to the bone. But that doesn't mean that the food is all gone.

Now is the opportunity for huge

numbers of polychaete worms, crabs, sea cucumbers, brittle stars and snails to move in. They nibble tissue and fat off the bones and crawl over the sea bed that the whale is lying on, picking up the bits that fell off as the big scavengers filled their bellies.



Photo credits: Bristle worm: prilfish, CC • Rattail: Wikipedia • Marine snails: treegrow, CC • Brittle star: Mu Eye, CC • Hagfish: Brian Gatwicke, CC • Greg Rouse O. rubiplumus female 2003 • Pink sea anemone: C • Seapig: Scotoplanes_globosa_and_crab • Background: SurfUpVector, istockphotos.com

Sea Pig with Graß hiding underneath



By Sheila Byers

Hagfish feeding on bits of flesh. Once most of the meat and blubber has been consumed, the Zombie worms arrive! They are bone specialists and it is their job to RECYCLE the bones! When they are done, there will be nothing left of the whale: not even the skeleton.

How can Zombie worms 'eat' the whale bones - especially since they have NO mouth parts? Well, they get another species to help them.

What happens? Each individual Zombie worm lives inside a transparent, jelly-like tube. This tube is topped with feathery palps through which the worm gets oxygen dissolved in the water. Inside this tube is a heart, blood vessels, long muscles and glands. The muscles let the worm pull in the palps if something disturbs it. At the bottom end of the trunk is a large sac where the female produces lots of eggs. This egg sac is covered with a green tissue that extends into root-like structures.

But wait! The Zombie worm is an animal, not a plant! Surely worms don't have roots?! Normally they don't - Zombie worms are the ONLY ones to have these root-like growths which dissolve their way into the whale bones by secreting an acid.

The reason Zombie worms can now settle into the bones is the fact that inside the green 'root' tissue there is a special kind of bacteria called Oceanospirillales. These bacteria digest the fats and oils inside the hard bone structure and pass on some of this nutrition to their hosts, the Zombie worms. Who needs mouth parts if you are getting fed by these helpers living inside you!

Because the bacteria are getting help by the acids digesting the whale bone, the root-like structure of the worms can grow deep inside the bones leaving only the trunk and crown of the worms poking out and getting oxygen dissolved in the water.

pink sea anemone

seums Victoria's Catching the ribrinopsis fernaldi

This partnership of the Zombie worms and the bacteria within them is called symbiosis as each partner helps the other. (Symbiosis: sym = together; biosis = living).

WARNING ZOMBIE WORMS AT WORK

How long does one whale fall provide food for Zombie worms and all the other bottom-dwelling scavengers?Depending on the location and size of the whale's body, one whale can provide enough food for 50 to 100 years. This is an excellent example of complete recycling of organic matter in the ocean. Every whale fall provides life for many organisms, big, medium and small. But it is the Zombie worms that finish the job by taking root inside the whale bones. After that's done, the bacteria that live in the Zombie worms digest the fat and oils within the bones, until there is nothing left. The Zombie worms and bacteria then become more food for many other smaller creatures. Nothing goes to waste!



Digesting the skeleton in seven years requires thousands of Zombie worms. Credit: © 2006 MBARI

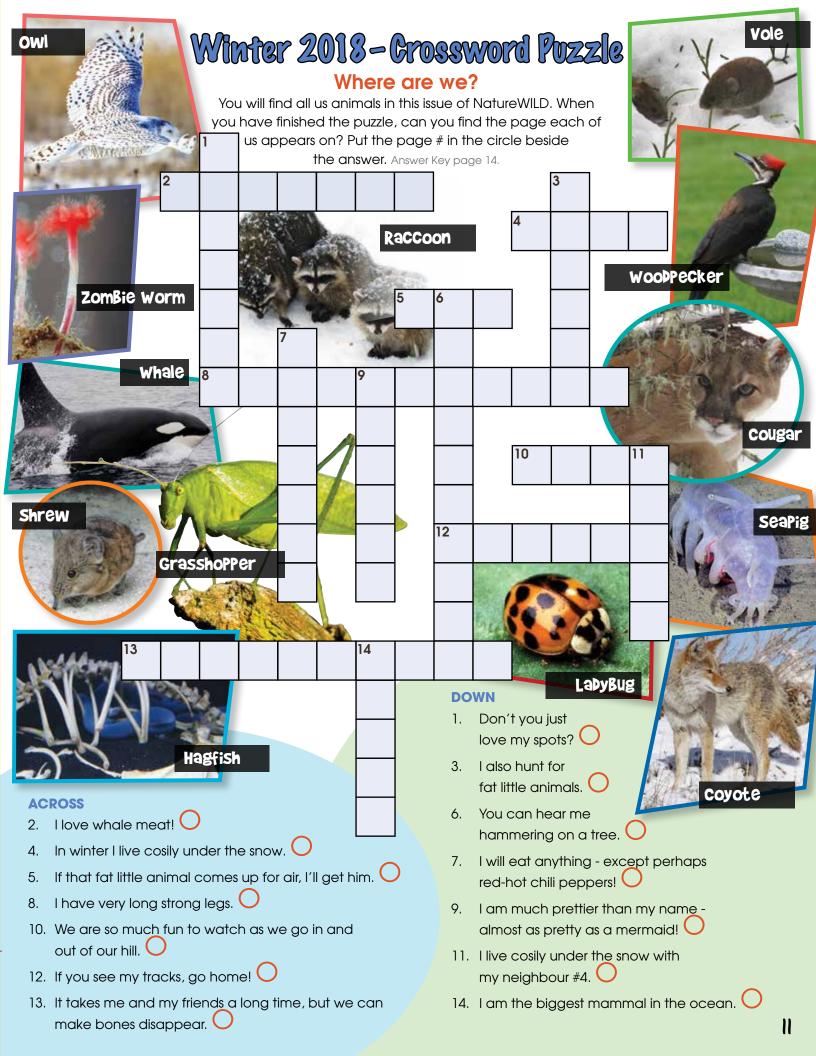
These photos were taken by the Monterey Bay Aquarium Research Institute using an underwater robot called Tiburon.

P.

https://www.youtube.com/watch?v=BppKscns1Rk (Puppet show) Whale Fall - after life of a whale

https://www.youtube.com/watch?v=I7t1WguYJyE

(Blue Planet - BBC Earth)



Long, long ago, before there were books, and even before there was reading and writing, there was story time. The children in that long ago time loved stories just as much as they do today. So their mothers and their fathers made their own stories to tell the children. They particularly liked to make stories about what they saw in the world around them. Here is one of those stories.

Why Evergreen Trees Keep Their Leaves in Winter

One time when it was getting cold and the birds knew that winter was coming, they all flew away to the warm south to wait for spring, just as they did every year. All the birds flew away except one, who had a broken wing and couldn't fly. He did not know what to do. He looked all around to see if there was any place where he could keep warm. And he saw the trees of the great forest.

"Perhaps the trees will keep me warm through the winter," he said.

So he went to the edge of the forest, hopping and fluttering with his broken wing. The first tree he came to was a Birch tree. "Lovely Birch tree," he said, "will you let me live in your warm branches until spring comes?"

"Dear me!" said the Birch, "what a thing to ask! I have to take care of my beautiful leaves through the winter, that's enough for me. Go away!"

Maple

Willow

So the little bird hopped and fluttered with his broken wing until he came to a great big **Maple** tree. "Oh, big Maple tree," said the little bird, "will you let me live in your warm branches until springtime comes?"

"Good gracious!" said the Maple "What a thing to ask! I don't take lodgers. Go away!"

So the little bird hopped and fluttered with his broken wing until he came to the Willow tree by the river.

"Oh, lovely **Willow** tree, will you let me live in your warm branches until the springtime comes?"

"No indeed!" said the Willow, "I never speak to strangers. Go away!" The poor little bird did not know where to go, but he hopped and fluttered along with his broken wing. Presently the Spruce tree saw him and said, "Where are you going, little bird?"

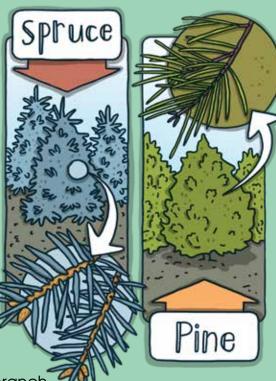
"I don't know," said the bird, "the trees will not let me live with them, and my wing is broken so that I cannot fly."

"You may live on one of my branches," said the **Spruce**, "there's an old nest for you to sit in."

"But may I stay all winter?"

"Yes, said the Spruce, "I would like to have you."

The **Pine** tree stood beside the spruce, and when he saw the little bird hopping and fluttering with his broken wing, he said, "My branches are not very warm, but I can keep the wind off because I am big and strong."



13

So the little bird fluttered up into the warm branch

of the Spruce, and the Pine kept the wind off his house. Then the JUNIPER

tree saw what was going on, and said that she would give the little bird his dinner all the winter, from her branches. Juniper berries are very good for little birds.

The little bird was very comfortable in his warm nest sheltered from the wind, with Juniper berries to eat.

The trees at the edge of the forest talked about it to each other.

"I wouldn't take care of a strange bird," said the Birch.



"I wouldn't allow lodgers," said the Oak.

"I wouldn't speak to strangers," said the Willow. And the three trees stood up very tall and proud.

That night the young North Wind came to play. He puffed at the leaves with his icy breath and found that every leaf he touched fell to the ground. This was great fun and he wanted to touch every leaf in the forest to make it fall off the tree.

"May I touch every leaf?" he said to his father, the Frost King.

"No," said the Frost King, "the trees which were kind to the bird with the broken wing may keep their leaves."

So the North Wind had to leave them alone, and the Spruce, the Pine and the Juniper trees kept their leaves through all the winter. And they have done so ever since.

Adapted from a story by Sarah Conan Bryant (1905) Illustrations by: Sara Theuerkauf

Have a Nature Question?



Al Grass has worked as a career park naturalist and ranger throughout BC. Now he is a well-known nature tour leader and photographer. Al especially likes birds, insects and spiders. Photo Credit: Robert Alexander, B.C.

How do Birds Keep Clean?-

Birds keep clean in several ways. They must, because feathers get dirty and who wants dirty feathers?

One way is that birds take baths. That is one reason that many people put out bird baths. It is fun to watch birds splashing about in the water as they seem to be having such a good time. Sometimes birds like sparrows will bathe in mud puddles!

After bathing a bird will need to preen its feathers. Preening means the bird is grooming itself with its bill – you can wash your hair and use a comb or a brush, but a bird uses its bill. Birds also have a preening gland at the base of their tail. The oily material from this gland is rubbed over the bill and then on the feathers to `condition' them. A good bird to watch grooming its feathers and reaching around to the base of its tail to get some "oil" to wipe into its feathers is the Canada Goose.

Bathing and preening are two ways that birds keep clean. Some birds even take dust baths to keep clean! Photo Credit: AI Grass, B.C.

Dr. Doowitt's project (Issue 3 2018)



In the last issue my experiment was to see which things really are biodegradable. As the summer was dry there was not much difference in the cardboard bowl, although it was softened by the rain and the waterproof coating had broken down. I feel it will deteriorate rapidly when the fall rains come in earnest. The doggy bag has become brittle in the strong sun and broke apart. I moved the bag to allow the soil to be turned over for fall which resulted in it cracking in half. I will leave the



bag and bowl staked out for winter and I will report on the other materials in the spring when they have had a little more time under and on top of the soil. Photo Credit: Dr. Doowitt

D) Coyotes Photo: Vincent Parsons, CC

Answer Key Crossword Puzzle Page 11 ACROSS - 2: p9 • 4: p3 • 5: p3 • 8: p6 • 10: p7 • 12: p16 • 13: p9 **DOWN -** 1: p6 • 3: p16 • 6: p14 • 7: p16 • 9: p9 • 11: p3 • 14: p11

Answers for Back Page – Match the footPrint!

Photo: Leo-set~A, CC

A) Kacoons Photo: USFWS Midwest Regian, CC C) Young Cougars Photo: USFWS Mountain Prairie, CC E) Squirrels

B) Deer Photo: danielle.brigida, CC



Passports to Nature

Siblings Amy and Sam (Delta Home Learners) sent in their first passports! Ken (North Vancouver) and Ryan and Josh (Nicomekl) sent in their 2nd passports. Nine (!) amazing NatureKids sent in their third passports -Andrew, Jacob, Olivia and Daniel (Merritt), Ryan and Josh (Nicomekl), Troy (Nanaimo), and Zoe and Brianna (Vancouver). Anna (Nelson) completed her 4th passport and Janel from Nanaimo completed her 7th. An extra big shout out to Maya from Delta Home Learners for completing her 11th passport (and earning a pair of binoculars!). Congratulations to everyone for being such great outdoor adventurers!



SPECIAL THANK YOU to NatureKids Victoria's Stephanie Weinstein

Stephanie has been the Leader of the Victoria NatureKids Club for more than five years and a bright and shining star in the NatureKids leadership team. Bringing a lifetime of experience as an environmental educator to her club and community, Stephanie championed new stewardship and citizen science projects from owls to pollinators and developed partnerships with like-minded organizations. With her co-leaders she created wonderful Explorer Day events to inspire a new generation of nature lovers in Victoria and beyond. We will miss having her as part of our team and wish her all the best in her future endeavours! Photo credit: Sandra Gabaglia

Delta Home Learners worked hard helping remove the invasive ivy that is choking trees in Forest Bay Park Preserve in Tsawwassen. The City of Delta is working to restore the park to a more natural state. Thank you, NatureKids!

Photo credit: Kevin Li, Michal Sirton





Comox Valley NatureKids visited the MARS Wildlife Rescue Centre in Merville, BC, where nature mentor Jo Styles gave the children a fantastic introduction to MARS wildlife hospital and its efforts to rehabilitate wildlife and educate people on how to help injured wildlife. Photo credit: Hayley Datoo

Led by naturalist Joanne Siderius, Nelson NatureKids learned all sorts of things about the ecology of Kokanee Creek Park on their fall nature walk. Photo credit: Jenni Stol

It's winter time and, depending on where you live, that means playing in the snow! While some animals sleep through the winter, many are awake and moving around, looking for food. Can you match the snowy tracks with the animals who made them? (answers page 14) Then go outside and search for footprints yourself.

1) Coyotes are meat eaters. Perhaps this coyote is on the track of a squirrel or a rabbit. Can you find its footprints as it goes searching for a meal? Photo credit: skeeze, CC



2) Deer are herbivores, they eat leaves, twigs and even lichens. When snow has fallen they can reach higher into shrubs for food. Search for this deer's tracks in the pictures below. Photo credit: Free-Photos, CC



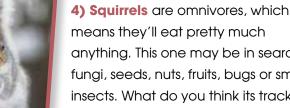
3) Young cougars hunt for raccoons, rabbits, hares, small rodents, sometimes pets and livestock. An adult cougar kills a deer or elk every 9 to 12 days, eats some of it and buries the rest for later. If you see a cougar print - go home at

once and tell an adult. Photo credit: skeeze, CC



5) Raccoons will eat

anything they can lay their



means they'll eat pretty much anything. This one may be in search of fungi, seeds, nuts, fruits, bugs or small insects. What do you think its tracks look like? Photo credit: bartlettbee, CC

clever little paws on! Fruits, nuts, meat, insects, frogs, eggs. This family may be after your food scraps!

Which picture do you think shows their snowy footprints? Photo credit: wlcutler, CC



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