WC DIGS

Engaging Students in your School Garden

2017-18 Professional Development Workshop Series

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WEST COUNTY DIGS
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WC DIGS Professional Development Workshop-

Engaging Students in Your School Garden

Tuesday, Feb 13th from 4:00-6:00

@ Mira Vista K-8 Upper Garden

Presenters: Graciella Rossi and Sarita Pockell

Agenda:

1. Getting Settled (4:00-4:15)
   - Share some food and drink
   - Sign in
2. Introductions and welcome (4:15-4:25) (Graciella)
3. Sample Intro Garden Activities (4:25 -5:35)
   - Mindfulness (2 min) Sarita
   - Quick Game (8 min) Melanie
   - Reviewing Rules Skit (5 minutes) Sarita and Graciella
   - Stations- Plants, Insects, soil, chores, food prep (each do a 30 second intro and hear bell for changing station) (2 minute intro and 4 stations of 10 minutes each)
   - Always have a Garden Closing and Song (Sarita...leads a regrouping, song and talk about unpacking garden experiences) (10 minutes)
4. Big Picture: Building a Garden Community (5:35-5:50)
   Small Group Activity: Give each a common core standard and discuss ideas in small groups
5. Closing (5:50-6:00)
   - Questions
   - Evaluations
   - Look at materials,
   - Pick up hand-out

Garden Educators-please make sure you sign in and out, complete a district evaluation form, and a DIGS workshop feedback form.

Thank you!

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Common Core Flourishes in the Garden

The school garden or outdoor space is a fantastic place to unpack standards and create experiential, project-based learning and fun. Here are some garden activities in various subject areas that align beautifully with the common core standards:

Language Arts

- Do a garden activity and use the steps to practice text structures like: description, cause and effect, sequence, or problem and solution.
- Create small groups and have students work through discussion questions around a text they are reading together while enjoying the outdoors in the garden. Ask them to discuss something specific or hypothesize about what will happen next. Call the groups back to a circle to share.
- Have reading time out in the garden.

Math

- Estimate and measure the volume of water and soil.
- Use yardsticks to section off equal sections of a garden bed. Plan, diagram, and plant the garden using this living graph.
- Measure parts of plants and compare the length and size of roots to stems to leaves.
- Measure ingredients when cooking. Double the recipes!
- Collect growing data to graph

Social Studies

- Learn to identify native plants and how the local Indigenous communities used them for food, shelter, medicine, art, and ritual.
- Plant a three sisters garden and use the lesson to discuss the benefits of diversity. "We are stronger together".
- Learn about our watershed and unpack local history through the story of our water.

Science

- Identify and study the parts of the plants.
- Learn about soil composition and the difference between carbon and minerals.
- Build understanding around food and nutrition by taking fruits and vegetables from plant to plate.

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Strategies for Successful Garden Education

What keeps you from taking students out to the garden? Here are some common barriers and strategies for keeping the outdoor learning manageable and fun for the teacher and the student:

Time: "We barely have enough hours in a day to get through all of our subjects."

- Use garden time in alignment with content standards rather than as something "extra".
- Let garden-time be your catch-up period. Schedule it as a regular part of your class timetable much like library time or PE. Decide each week what subject matter needs to be covered and use the outdoor time in the garden to give that lesson.
- Remember that even a short session in the garden, observing the changes taking place, can front-load a large discussion and writing session in the class. Try doing the observation in the garden and unpack it back in the classroom.

Behavior: "It is difficult to control the class when we are out in the garden."

- Make sure to review garden rules and expectations before heading out.
- Try giving all of the instructions for garden activities and organizing students into small groups back in the classroom. When they enter the garden, they will already know what to do and can get right to it.
- Have some some small activities on hand that students can do independently or with friends if they complete the main activity. These might include treasure hunts, pulling weeds (competitions around who can pull out the largest stem are quite successful), watering plants, or spreading mulch. Behavior is always better when students have something fun to do and contribute.

Safety "I feel nervous that someone will get hurt."

- Setting expectations by reviewing garden rules is crucial. Have students raise their hands to recall the rules before you go out each time.
- Make sure you have some spray bottles with biodegradable soapy water for washing hands and cleaning harvested food before eating.
- Safety in the garden is closely linked to behavior management. If students are engaged and know what is expected of them, there is little risk of injury or harm.

Garden Rules for Safety and Courtesy

Move gently through the garden. No running. Look, Listen, and Remember

Hold hand tools below the waist with sharp points facing down. Hold large tools below the shoulders. Rest tools against wall not on ground.

Be courteous to your classmates. Don't throw soil, rocks, or other materials.

Save water whenever possible. Only use as much water as necessary.

Ask before watering, picking or harvesting.

Respect the plants and creatures. Do not squish bugs.

Do not stand on or in the beds.

Return all supplies and tools to the shed after use.

Do what is asked of you.

Have fun. Watch How The Garden Changes

Promote Good Will

Independent and Small Group Tasks – all tasks involve instruction on best methods

Hand watering with watering containers

Digging out weeds with trowels

Mulching

Picking up trash and green waste

Planting and transplanting

Mapping the Garden

Going on Scavenger Hunts

Observing and recording good and bad bugs, flower parts, plant growth, leaves, soils

Harvesting

Preparing Food

Sketching/Journaling

Build a culture around having an opening and closing circle and write the theme on the whiteboard. You can write up the garden jobs and have rotating groups

Name _____

Description Writing Frame

Use the Writing Frame below to summarize the selection.

People are trying to help by _____

_____.

First, they are _____

_____

_____.

This is important because _____

_____

_____.

.They are also _____

_____

_____.

This is important because _____

_____

_____.

Rewrite the completed summary on another sheet of paper. Keep it as a model for writing a summary of an article or selection using this Text Structure.

Name _____

Comprehension

Sequence Writing Frame

Use the Writing Frame below to summarize the selection.

The first step in making a _____ is to _____

_____.

After that, you must _____

_____

_____.

Thirdly, you need to _____

_____

_____.

Finally, you _____

_____

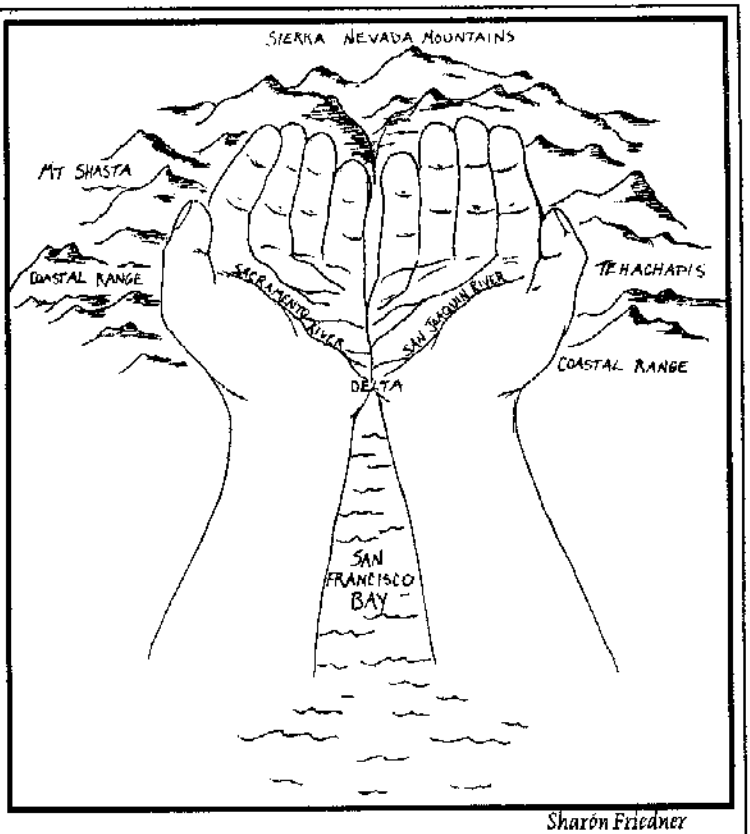
_____.

Rewrite the completed summary on another sheet of paper. Keep it as a model for writing a summary of an article or selection using this Text Structure.

The San Francisco Bay's Watershed in Your Hands

TEACHER'S PAGES

Overview
Students first use crumpled paper to create a model demonstrating the basic features of a watershed. They then create the San Francisco Bay's Watershed using their hands to represent major geographical features.



Sharón Friedner

Estimated Time
30 minutes

Objectives
Students will be able to:
- Describe the major geographical features of San Francisco Bay'sWatershed.
- Define the term "watershed."

Materials
- One sheet of 8 ½" X 11" paper for each student (reuse one-sided paper for this activity)
- Water soluble markers or watercolors, paintbrushes, and cups of water
- Spray bottles of water
- A pair of hands!
- Overhead of "Watershed in Your Hands" and/or a map of California

Vocabulary
watershed, ridge lines, urban runoff, drainage, erosion

California Science Content Standards
Grade 4
Standard Set 5.c: moving water erodes landforms, reshaping the land by taking it away from some places and depositing it as pebbles, sand, silt, and mud in other places (weathering, transport, and deposition).
Grade 5
Standard Set 3.e: the origin of the water used by their local communities.
Grade 6
Standard Set 2.a: water running downhill is the dominant process in shaping the landscape, including California's landscape.

Adapted from Kids in Creeks, by Aquatic Outreach Institute

Additional Resources
The Watershed Project
http://www.aoinstitute.org/
Watershed Finder
http://www.museumca.org/creeks/resc.html

Background

A watershed is defined as *an area of land that water flows over or through on its way to a larger body of water*; a watershed is the drainage basin for a body of water, such as the San Francisco Bay. Everyone lives in a watershed. Homes, farms, ranches, forests, small towns, big cities and more exist in watersheds. Watersheds can be large or small. Some cross county, state, and even international borders. Larger watersheds are comprised of many small ones. For example, if water from your schoolyard drains into a creek, and that creek drains into San Francisco Bay, you are part of that creek's watershed, which is in turn part of the San Francisco Bay's watershed.

"A watershed starts at mountain peaks and hilltops. Snowmelt and rainfall wash over and through the high ground into rivulets which drain into fast-flowing mountain streams. As the streams descend, tributaries and groundwater add to their volume and they become rivers. As they leave the mountains, rivers slow and start to meander and braid, seeking the path of least resistance across widening valleys, whose alluvial floor was laid down by millennia of sediment-laden floods. Eventually the river will flow into a lake or ocean. Where the river is muddy and the land is flat, the sediments laid down by the river may form a delta, splitting the river into a bird-foot of distributaries which discharge into the sea. The river's estuary, the place where its sweet waters mix with the ocean's salt, is one of the most biologically-productive parts of the river – and of the ocean." (Patrick McCully, Silenced Rivers: The Ecology and Politics of Large Dams)

The California watershed covers approximately 40% of the state of California. It begins in the Sierra Nevada mountain range, continues through the Central Valley, and eventually drains into the San Francisco Bay and out into the ocean. By tracing the path of water as it flows through the watershed and into the Bay, one can begin to understand how everyone who lives in the watershed can affect the Bay's health.

Teacher Procedure

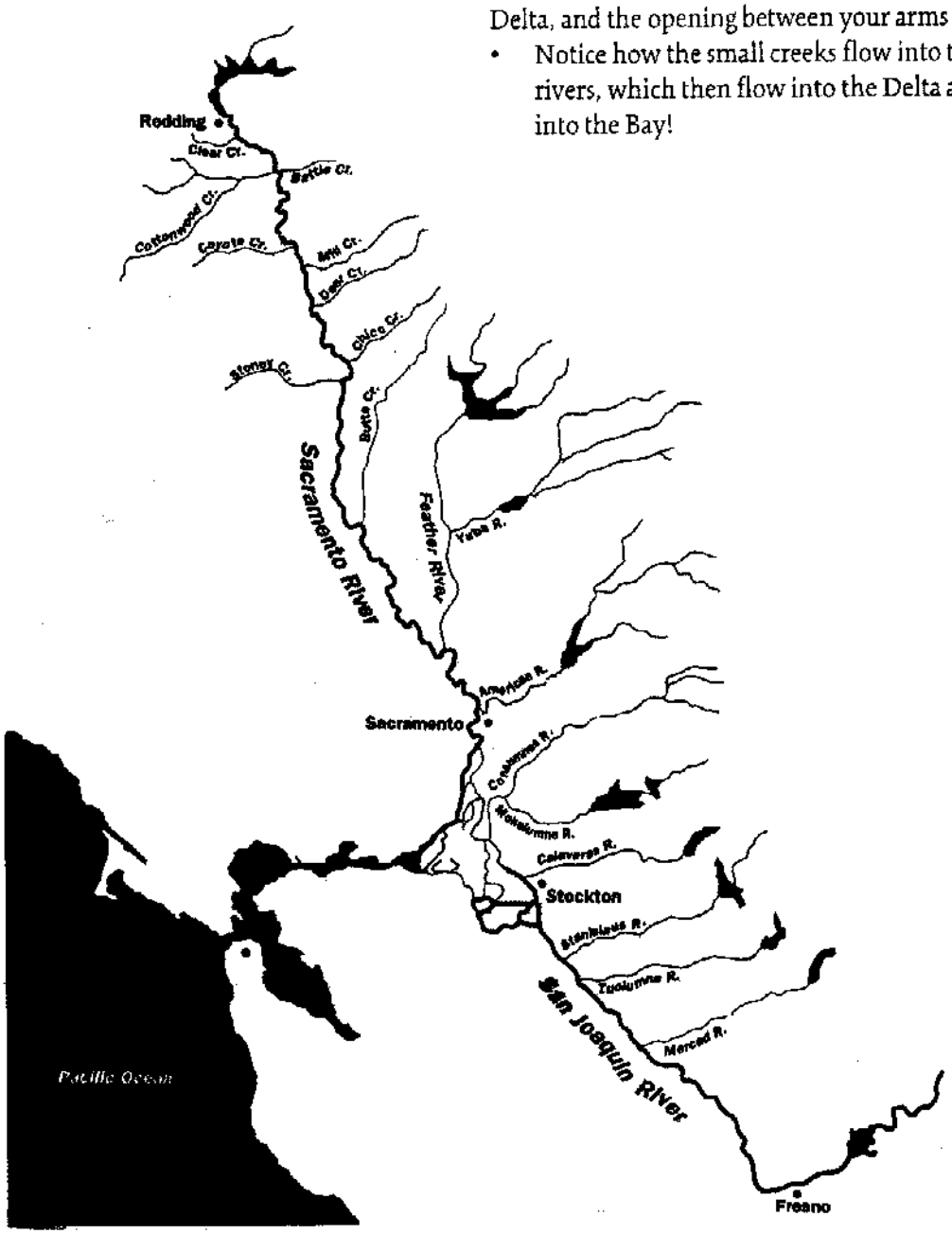
Making a Watershed Model

1. Conduct this activity outside or in an area that can get slightly wet (lab area, tables with paper towels nearby, etc.)
2. Pass out a piece of paper and water soluble markers or water color supplies.
3. Instruct the students to crumple their piece of paper into a ball and to gently open up the paper without flattening it out completely. It should look like a landscape with mountains and valleys.
4. They should use one color to represent ridge lines, the highest points on the paper, which separate one valley from another.
5. Another color should be used to represent bodies of water. They may need to guess where rivers or lakes will form on their landscape.
6. A third color should be used to represent human settlements, such as houses, factories, offices, roads, etc.
7. Either hand out the spray bottles to a few students or walk around the classroom with one spray bottle, lightly spraying the finished maps. The spray represents rainfall. The students should notice where rain travels on their landscape.
8. Lead a discussion using some of the following questions:
   - What path does the rain take on your landscape?
   - How does this landscape represent the idea of a watershed?
   - What happened to human settlements? Was there erosion or urban runoff?
   - How should the flow of water affect our choice of building sites within a watershed?

Watershed in Your Hands

1. Tell the students that they can use their hands to make a model of San Francisco Bay's watershed.

2. You can use a map of California and the overhead of "Watershed in Your Hands" while you are doing this activity to help your students identify major geographical features of the San Francisco Bay's Watershed.
   - Put your hands together, palms upward, and curve them to make a bowl.
   - Imagine that the tips of your fingers are the peaks of the Sierra Nevada Mountain Range.
   - Your left thumb is Mount Shasta, your right thumb is the Tehachapi Mountain Range, and the fleshy parts at the bases of your thumbs are the Coastal Range.
   - The cracks between your fingers are all the small creeks and rivers trickling down from the Sierras, such as the American, Kern, and Mokelumne.
   - The large crease in your left palm (sometimes called your "lifeline") represents the Sacramento River, and the crease in your right palm represents the San Joaquin River.
   - The crack between your two hands represents the Delta, and the opening between your arms is the Bay.
   - Notice how the small creeks flow into the large rivers, which then flow into the Delta and out into the Bay!



Ten Gardening Tips To Help Keep Our Waterways Clean

Believe it or not, washing your car, changing your oil, spraying with pesticides can all pollute our Bay Area waters. When pesticides and other pollutants are washed into storm drains by rain or over-watering they wind up in our creeks and Bay. You can help to keep our watershed from contamination by using these garden tips.

- Limit your use of insecticides, herbicides, fertilizers and other garden chemicals.
- Use less toxic products like oil sprays and biological pesticides.
- Encourage natural pests predators such as birds, ladybugs, lacewings, toads and garter snakes.
- Grow flowering plants to provide beneficial insects with nectar year round.
- Put up traps, barriers, and snail baits.
- Remove ivy, rotting fruit, and other pest attracters.
- Choose plants that require less water and fewer chemicals, particularly native plants,
- Pull or hoe weeds before they flower and leave seeds.
- Compost garden trimmings to make a natural fertilizer.
- Pick the right spot for your plants. Healthier plants are more pest resistant.

<u>Matter & Energy:</u> Solid, Liquid, & Gas The Sun & Photosynthesis Weather & Temperature Biogeochemical cycles: Carbon, Nitrogen, Oxygen, Phosphorus, Sulfur, Rocks	
<u>Planting, Harvesting & Cooking in the Garden:</u> Planting/Transplanting Seasonal Gardening Fruits and Veggies Healthy Food Choices Recipes	
<u>Water Systems:</u> The Water Cycle Weather & Climate Watersheds Weathering & Erosion Water in the Garden	
<u>Other Ideas:</u>	

Math is an interdisciplinary language and tool that helps us understand the logic of quantity, shape, space, and change.
We use math every time we count, measure, sort, convert, multiply, predict, test, record data, graph data, interpret data, draw conclusions, make inferences, solve word problems.... and beyond!

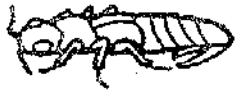
How can we bring math to life for our students using the garden or outdoor classroom?

THEMES	Math Connections and Activities
Plant Structure & Function: Life Cycle of a Plant Plant Vascular Systems Plant Adaptations Roots, Stems, Leaves, Flowers, Fruits, and Seeds	
Animals & Environments: Worms, Insects, & Pollinators Habitats and Ecosystems Food Chains/Webs Adaptations	
Rocks, Soil & Compost: Decomposition Fungi and Bacteria Nutrients & Minerals Landforms/Erosion	

COMPOST CRITTERS WORKSHEET

CIRCLE ME IF YOU CAN FIND ME

COLLEMBOLA



SPRINGTAIL

MITE

WORM COCOON

SLUG

SOW BUG

FRUIT FLY

WHITE WORM

BEETLE

REDWORM

SPIDER

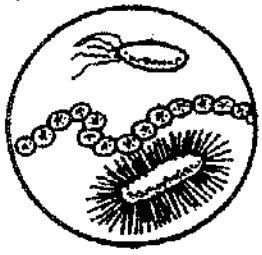
SNAIL

MOLD

ANT

MILLIPEDE

CENTIPEDE



BACTERIA

PILL BUG

Compost Critters Information Sheet

Pill Bug or Roly Poly

I am an isopod, which means I have ten pairs of legs that look very similar to each other. I eat old leaves and veggie scraps. I am about ½ inch long and roll up in a ball if I am disturbed. Some people think that I look like a little armadillo. I am a grayish, dark color.

Centipede

I move quickly on my many legs. I have 15-137 segments with a pair of legs on each. I am a fierce hunter. I love to eat earthworms. I use my pair of poison claws to help keep my prey from getting away. I am about 1 to 2 inches long. I am usually reddish brown.

Ant

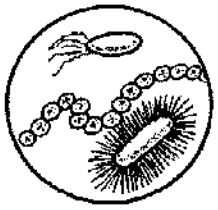
I am an insect with 6 legs. I help to decompose by breaking materials into smaller particles. I create tunnels, and move soil into clumps. Some people would rather not have me around their homes. I am black, brown, or red.

White Worm

I look like a frayed piece of thread. I am a skinny, white worm. I am ½ to 1 inch long. I am related to an earthworm. I like to eat rotting food after the other bugs get to it. You might think of me as one who likes to finish off the job.

Bacteria

We are so tiny that you can't even see us. We are everywhere. I am colorless. I can eat almost anything. Some of us live together in groups and others don't.



Mold

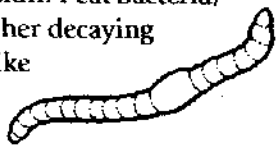
I am a fungus. I am related to mushrooms. Most of us live on old food. You might see me on old food in your home or your worm bin.

Sow Bug

I have 10 pairs of legs. That makes me an isopod like my cousin the Roly Poly. I eat vegetation and old leaves. My ½-inch-long body is oval and flat with flattened plates, but I can't roll up into a ball like Roly Poly. I am related to crayfish and lobsters. I breathe with gills so I must live in a damp, moist place. I am a dark, grayish color.

Earthworm

I am a long, thin, soft-bodied animal. My body is made up of little segments. I do not have legs or eyes. I sense light and I breathe through my skin. I eat bacteria, fungi, and other decaying materials. I like dark, moist places.



Fruit Fly

I am a very small fly. People don't like me, but I don't bite, sting, or make buzzing sounds. I don't harm earthworms either. Sometimes you will see me around a worm bin if a person forgot to bury their food. I like to lay my eggs where it's moist and warm.

Next Generation Science Standards

Science and Engineering Practices:

1. Asking questions and defining problems
2. Developing and using models
3. Planning and carry out investigations
4. Analyzing and interpreting data
5. Using mathematics and computational thinking
6. Constructing explanations and designing solutions
7. Engaging in argument from evidence
8. Obtaining, evaluating, and communication information

Crosscutting Concepts:

1. *Patterns*. Observed patterns of forms and events guide organization and classification, and they prompt questions about relationships and the factors that influence them.
2. *Cause and effect: Mechanism and explanation*. Events have causes, sometimes simple, sometimes multifaceted. A major activity of science is investigating and explaining causal relationships and the mechanisms by which they are mediated. Such mechanisms can then be tested across given contexts and used to predict and explain events in new contexts.
3. *Scale, proportion, and quantity*. In considering phenomena, it is critical to recognize what is relevant at different measures of size, time, and energy and to recognize how changes in scale, proportion, or quantity affect a system's structure or performance.
4. *Systems and system models*. Defining the system under study – specifying its boundaries and making explicit a model of that system – provides tools for understanding and testing ideas that are applicable throughout science and engineering.
5. *Energy and matter: Flows, cycles, and conservation*. Tracking fluxes of energy and mater into, out of, and within systems helps one understand the systems' possibilities and limitations.
6. *Structure and function*. The way in which an object or living thing is shaped and its substructure determine many of its properties and functions.
7. *Stability and change*. For natural and built systems alike, conditions of stability and determinants of rates of change or evolution of a system are critical elements of study.

Healthy Alternatives for Snacks, Birthday Parties, and Other Classroom Celebrations

Fresh Produce:
Vegetables (Examples: carrots, jicama, sugar snap peas, cherry tomatoes, peppers)
Fruits (Examples: apples, pears, bananas, oranges, persimmons, grapes, berries)

Trays, either purchased or made at home:
Assorted Vegetables
Assorted Fruits

Combination Platters, either purchased or made at home:
Lean Meats and Cheeses
Cheeses and Multigrain Crackers
Vegetables and Hummus
Whole Wheat Pita Wedges and Hummus
Multigrain Tortilla Chips and Salsa
Multigrain Tortilla Chips and Guacamole
Apple Slices and Almond Butter or Sunflower Seed Butter
Sugar Snap Peas and Bean Dip

Crunchy Snacks:
Multigrain Tortilla Chips
Multigrain Pretzel Nuggets
Pretzel Sticks
Air-popped Popcorn
Whole Wheat Pita Chips

Dairy:
String Cheese
Yoghurt Tubes (no more than 9 gr. of sugar)