



INTEGRATED PEST MANAGEMENT: ANTS

Columns of ants marching through playrooms, eating areas and kitchens in early care and education programs are a common problem. Don't panic! There are safe and effective ways to reduce the number of invading ants. Integrated pest management (IPM) is a strategy to prevent ant invasions, minimize pesticide use and reduce harmful exposure to children, staff and the environment.

When are ants a problem?

Some ants bite or sting, but most ants in California do not threaten human health, and they help control other pests like fleas, caterpillars and termites. A few ants sting, like the native fire ants and harvester ants, which live outdoors. The most aggressive stinging ant is the red imported fire ant, which has been found in southern California. If you suspect a fire ant infestation, report it to your county agricultural commissioner.

Characteristics and habits

Ants look for food and water to take back to their nests. They may appear suddenly in buildings if other food sources become unavailable or weather conditions change. Ants live in soil next to buildings, along sidewalks, and under stones, tree stumps, plants, boards or other protected places. Depending on the ant species and the time of year, ants eat sweets—especially a sticky substance called honeydew that is made by aphids—fruits, seeds, cooking grease, dead or live insects or dead animals. Ants often enter buildings seeking food, water, warmth and shelter, or refuge from dry, hot weather or flooded conditions.

The most common ant in California is the Argentine ant. Other ant pests include the pharaoh ant, pavement ant, odorous house ant, thief ant and velvety tree ant.

A new colony is usually established by a newly mated queen. As the colony grows over the years, it produces winged male and female ants, which leave the nest to mate and form new colonies. Unlike other ant species in California, Argentine ants have colonies that blend together to make up one large super colony with many queens. This is one reason completely eliminating these ants is impossible.

IPM strategies

1 DON'T SPRAY!

Spraying pesticides may kill ants, but spraying will expose staff and children to harmful chemicals, and doesn't eliminate ants in their nests. Pesticide residues can build up indoors where children spend a lot of time. Ant management should focus on good sanitation and maintenance, not on spraying pesticides.

Ant management requires continuous effort and its goal is to reduce the number of ants in ECE programs. You don't have to completely eliminate ants from outdoor areas because ants help control other pests like fleas, caterpillars and termites.

2 KEEP ANTS OUT

- ▶ When you see ant trails in your building, follow the ants to their entry point. Caulk cracks around foundations or openings that provide entry from outside. Pay special attention to where wires and pipes enter the building, because this is a favorite entry point for ants.
- ▶ Keep plants and mulch at least 12 inches from the foundations of buildings; they provide nesting sites for ants.

3 REMOVE ANTS' FOOD, WATER AND SHELTER

- ▶ Store food items such as snacks, sugar, syrup, honey and pet food in closed containers.
- ▶ Wipe spills from outer surfaces of containers, and from counters, tables and floors.
- ▶ Remove garbage from the kitchen at the end of each day.
- ▶ Repair leaky sinks and pipes.
- ▶ Seal indoor cracks and crevices.



ACTION PLAN FOR ANTS

WHEN TO TAKE ACTION	NONPESTICIDE PRACTICES	LEAST HARMFUL PESTICIDE	LAST RESORT
<ul style="list-style-type: none"> ▶ If you see a few ants inside, there are likely to be more soon. 	<ul style="list-style-type: none"> ▶ Clean up ants using a sponge or paper towel with soapy water. ▶ Fill any ant entryways with caulk or petroleum jelly. ▶ Remove infested potted plants. ▶ Clean up food sources. ▶ Eliminate leaks or water sources. 	<ul style="list-style-type: none"> ▶ Rely on baits, a non-spray pesticide, to manage the ants. 	<ul style="list-style-type: none"> ▶ If you hire a PMP, insist that they use baits rather than perimeter treatments or monthly sprays.

When should you hire a pest management professional (PMP)?

If ants continue to plague you indoors, work with a PMP who practices IPM to create a management plan. Pesticides should only be used as a last resort.

RESOURCES

University of California Statewide IPM—Ants
www.ipm.ucdavis.edu/PMG/PESTNOTES/pn7411.html
 Our Water, Our World—Controlling Ants in Your House
ourwaterourworld.org.dnnmax.com/Portals/o/documents/pdf/Ants%2009.pdf
 County Agricultural Commissioner List (if you think you have red imported fire ants)
www.cdffa.ca.gov/exec/county/county_contacts.html

California Childcare Health Program, University of California, San Francisco School of Nursing • cchp.ucsf.edu

INTEGRATED PEST MANAGEMENT: **BED BUGS**



Common before the 1950s, bed bugs are back, showing up in homes, apartment buildings, dorm rooms, hotels, child care centers, and family child care homes. Adult bed bugs are flattened brownish-red insects, about ¼-inch long, the size of an apple seed. They're fast movers, but they don't fly or jump. They feed only on blood and can survive several months without a meal.

When are bed bugs a problem?

Thankfully, bed bugs do not spread disease. However, when people think they have bed bugs, they may sleep poorly and worry about being bitten.

Bed bug bites:

- ▶ Can cause swelling, redness, and itching, although many people don't react at all.
- ▶ Are found in a semi-circle, line, or one-at-a-time.
- ▶ Resemble rashes or bites from other insects such as mosquitoes or fleas.
- ▶ Can get infected from frequent scratching and may require medication prescribed by a health care provider.

How do bed bugs get in a child care center?

They usually arrive with a child who has an infestation at home by attaching to clothing, blankets, backpacks, or soft toys. Bed bugs will infest spotlessly clean rooms as well as messy or dirty ones. Since bed bugs are so good at hiding, the more clutter you have, the harder it is to find them and the more likely their numbers will increase.

Bed bug life cycle

Young bed bugs, called nymphs, look like small versions of adult bed bugs. The youngest nymphs are the size of a poppy seed and turn dark red after they feed. As a nymph grows to the next stage, it sheds its skin. The skins accumulate where the bugs hide. Bed bugs live in groups. Once females mate, they often wander away to lay their eggs somewhere else. This is sometimes how the bugs end up in other rooms. Eggs are tiny, pale, see-through, and hard to find. Eggs stick to surfaces, especially wood, cardboard, and fabric which is why you should check furniture, cardboard boxes, and clothing for bugs, their droppings, shed skins, and eggs. You'll find bed bugs year-round. Bed bugs usually move around and feed at night, but visit daytime nappers.

How to check for bed bugs

- ▶ Prepare an inspection kit that includes a good flashlight and magnifying glass to look for bed bugs, eggs, droppings, bloodstains, or shed skins.
- ▶ Inspect the nap area regularly. Use a flashlight to examine nap mats, mattresses (especially seams), bedding, cribs, and other furniture in the area.
 - ▷ Check under buttons of vinyl nap mats.
 - ▷ Roll cribs on their side to check the lower portions.
 - ▷ Scan the walls and ceiling and look behind baseboards and electrical outlet plates for bugs, eggs, droppings, bloodstains, and shed skins. The dark spots or bloodstains may look like dark-brown ink spots.
 - ▷ Examine upholstered furniture and wall-mounted items such as clocks, pictures, and mirrors.
- ▶ Collect any suspicious insects or shed skins for an expert to identify. Bring samples to your local UC Cooperative Extension or agricultural commissioner's office. Use a small pill vial or clear packing tape for this purpose. Photographs of suspicious bloodstains may also help identify the bugs.

IPM Strategies

1 DON'T SPRAY!

If you're worried that your center has bed bugs, resist the impulse to spray pesticides. Setting off foggers and bug bombs will not prevent infestations. The pesticides will not reach places where the bugs are hiding.

- ▶ Do not try to take on bed bugs yourself. This is a job for an expert.
- ▶ Avoid spraying pesticides on bed linens, pillows, stuffed animals, clothing, or people. Don't use pesticide-containing mattress covers; instead, use a mattress encasement.

[IPM Strategies continued]

2 HIRE A PEST MANAGEMENT PROFESSIONAL (PMP)

Make sure you actually have bed bugs before any treatment starts. Be prepared to work closely with your PMP, who will explain how you can prepare for treatment by reducing clutter, vacuuming, cleaning, and laundering. Mention what you've seen, collected, or photographed. If you don't have a PMP and you're concerned about bed bugs, hire a PMP who is licensed, insured, and has experience working with bed bugs. (See www.pcoc.org to find qualified PMPs in your area). Many PMPs prefer treating bed bugs with heat rather than spraying pesticides because heat reaches places where bed bugs hide. Expect 2-4 visits to be sure the bed bugs are gone.

3 KEEP YOUR THINGS

Don't throw anything away, even nap mats and mattresses. You can easily clean these, especially if you've caught the infestation early.

- ▶ **Mattresses.** Vacuum thoroughly, especially around seams and anywhere a small, flat bug could hide. Enclose the mattress in a high-quality mattress encasement. Encasements are machine-washable covers that snugly wrap around mattresses. Good encasements have bug-tight zippers and are made of strong but flexible fabric that won't easily tear.
 - ▶ If bed bugs already live in a mattress, the encasement will trap them inside so they won't bite the sleeper.
 - ▶ Bed bugs can live on top of an encasement, but they'll be easier to find. (They can still live elsewhere in the room and bite sleepers).

- ▶ The following encasements have bed bug-proof fabric and zippers: Allergy Luxe®, National Allergy® BedCare Elegance, and Mattress Safe®. All come in crib mattress size.

- ▶ **Nap mats.** Vinyl mats: vacuum and then wash with soapy water, especially along seams and under buttons. Soft, washable mats: machine-wash and then place in a hot dryer for at least 20 minutes.
- ▶ **Soft items.** Pillows, linens, blankets, and stuffed animals: machine wash and then place in a hot dryer for at least 20 minutes. If the item isn't washable, tumble in a hot dryer for 20 minutes.

4 PREVENT

- ▶ Reduce clutter! Store toys, stuffed animals, and dress-up clothes in plastic boxes with tight-fitting lids.
- ▶ Seal cracks and crevices to eliminate hiding places for bed bugs and other pests. Caulk and paint wooden baseboards or molding around ceilings.
- ▶ Vacuum the nap area frequently using a crevice tool around molding, the area between wall and ceiling, and the seams of mattresses. Vacuuming is the most important thing you can do to catch stray bed bugs.
- ▶ Wash bedding frequently. Every few days, toss pillows and blankets into a hot dryer for 20 minutes. Enclose crib mattresses in high-quality mattress encasements.

ACTION PLAN FOR BED BUGS

WHEN TO TAKE ACTION	NONPESTICIDE PRACTICES	LAST RESORT
<ul style="list-style-type: none"> ▶ When you see bed bugs, eggs, droppings, bloodstains, or shed skins. 	<ul style="list-style-type: none"> ▶ Vacuum. ▶ Clean mattresses, nap mats, bedding, and other soft items. 	<ul style="list-style-type: none"> ▶ Seal cracks and crevices. ▶ Hire a pest management professional.

RESOURCES

- Centers for Diseases Control and Prevention, Emerging Infectious Disease www.cdc.gov/ncidod/EID/
- California Department of Pesticide Regulation, Bed Bugs are Back! www.cdpr.ca.gov/docs/pestmgmt/pubs/childcare/bedbugs_color.pdf
- California Childcare Health Program (CCHP), *Bed Bugs – What You Need To Know* cchp.ucsf.edu/BedBugs-FAM
- U.S. Environmental Protection Agency, Bed Bugs: Get Them Out and Keep Them Out www2.epa.gov/bedbugs

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INTEGRATED PEST MANAGEMENT: COCKROACHES

Cockroaches are common pests in child care. There are many kinds of cockroaches. Some live indoors; others live outdoors. Only some cockroaches cause problems indoors. Many providers respond to any cockroach by reaching for the spray can. There are health reasons for wanting cockroaches out of your indoor environment, but you can actually manage cockroaches much better when you don't spray.

When are cockroaches a problem?

Saliva and droppings (feces) from roaches can trigger asthma, especially in young children. Cockroaches also spread bacteria and other harmful germs as they crawl through sewers and decaying substances, and carry these germs into ECE facilities.

Characteristics and habits

Before you try to eliminate cockroaches, identify what kind they are. German cockroaches are the most common indoor cockroach in California.

GERMAN COCKROACHES:

- ▶ look like small adults without wings when young.
- ▶ shed their skin six times as they grow. These cast-off skins become an asthma trigger.



German cockroach, young and adult

To identify the cockroaches in your facility, visit: www.ipm.ucdavis.edu/PMG/PESTNOTES/pn7467.html#IDENTIFICATION or consult with your pest management professional.

ALL COCKROACHES:

- ▶ leave droppings (dark spots or smears).
- ▶ need moisture or a reliable water source to live. Outdoor cockroaches live in moist environments such as sewers.
- ▶ are active at night. If you see cockroaches during the day, beware—you probably have a large infestation.

- ▶ Scurry into hiding places when they sense noise, movement and light. German cockroaches fit into spaces 1/16-inch wide. They avoid open spaces, so place sticky traps next to walls.
- ▶ Reproduce rapidly. One female German cockroach and offspring can produce 30,000 roaches in a year.

IPM strategies

1 DON'T SPRAY!

- ▶ Sprays or bug bombs may kill a few cockroaches but will not penetrate hiding places or kill eggs, and can harm people, pets and the environment.

2 KEEP COCKROACHES OUT

German cockroaches can enter buildings hidden in grocery bags or in deliveries. Cockroaches sometimes slip under doors from nearby infested buildings. Outdoor cockroaches can sneak in through narrow gaps in windows and doorways.

- ▶ Install tight-fitting weather stripping and screens on windows, and doorsweeps.
- ▶ Seal cracks and crevices in walls and floors.

3 REMOVE COCKROACHES' FOOD, WATER AND SHELTER

- ▶ Clean spilled food, dirty dishes and utensils, and surfaces before leaving for the day.
- ▶ Keep drains, shelves and counters clean.
- ▶ Store food in containers with tight-fitting lids.
- ▶ Fix leaks under sinks or dripping faucets.
- ▶ Vacuum possible cockroach hiding places thoroughly using a strong vacuum with a crevice attachment.
- ▶ Empty garbage at the end of each day and keep indoor garbage in lined, covered containers.
- ▶ Place outdoor garbage containers on hard, cleanable surfaces (concrete is best) away from building entrances.
- ▶ Rinse bottles and cans before placing in the recycling bin.
- ▶ Take supplies out of boxes and store in cupboards or on open metal shelving. Corrugated cardboard boxes are a favorite hiding place for cockroaches. They eat the glue and lay their eggs in the corrugation.



[IPM strategies continued]

4 MONITOR

- ▶ Look for cockroaches behind or under cabinets and appliances using a magnifying glass and dental mirror. Check behind bulletin boards, mirrors and other wall fixtures. Look for cockroach droppings, cast skins and dead cockroaches.
- ▶ Locate hiding places by placing sticky traps under sinks and on the floor next to walls and appliances. When traps become clogged with cockroaches, throw them away and replace with new ones.
- ▶ Once you find where cockroaches hide, focus your efforts there. Put monitoring traps in that area.
- ▶ Keep monitoring traps in the same places (don't move them around), and make sure they're inaccessible to children.
- ▶ Monitor daily during a severe infestation, and write down how many cockroaches you have per trap and their age range. A lot of young cockroaches (smaller and wingless) indicate you have an active infestation. Keep a written log to monitor where traps are located.

5 MANAGEMENT

GETTING RID OF COCKROACHES

- ▶ Don't spray or use bug bombs – cockroaches will just scatter and return later.
- ▶ Bait stations and gels are effective and exempt from the Healthy Schools Act.

Bait stations are:

- ▶ small plastic containers with a mix of insecticide and bait inside.
- ▶ placed where cockroaches have been found.
- ▶ effective for several months.

Gels are:

- ▶ applied with a syringe along cracks and crevices where cockroaches have been found.
- ▶ effective for a few days.

Boric acid powder is:

- ▶ not exempt from the Healthy Schools Act.
- ▶ effective when blown into wall voids, behind electrical outlets, appliances or other undisturbed hiding places.
- ▶ effective for years, as long as it stays dry.

ACTION PLAN FOR COCKROACHES

WHEN TO TAKE ACTION	NONPESTICIDE PRACTICES	LEAST HARMFUL PESTICIDE	LAST RESORT
<ul style="list-style-type: none"> ▶ When you see one cockroach! ▶ If you see one cockroach there are likely more. 	<ul style="list-style-type: none"> ▶ Monitor with sticky traps. ▶ Caulk and seal hiding places. ▶ Clean all surfaces and store food in sealed containers. ▶ Remove clutter. ▶ Vacuum with a HEPA vacuum. ▶ Fix water leaks. 	<ul style="list-style-type: none"> ▶ Cockroach bait stations or gel applied to cracks and areas out of children's reach. 	<ul style="list-style-type: none"> ▶ If you have a serious infestation or think an expert would do a more thorough job, hire a PMP who uses IPM practices. ▶ Insect growth regulators applied to areas where cockroaches are hiding. ▶ Boric acid powder applied to dry, inaccessible areas.

RESOURCES

University of California Statewide IPM Program:
Cockroaches
www.ipm.ucdavis.edu/PMG/PESTNOTES/pn7467.htm

The Department of Pesticide Regulation, *Safely Managing a Cockroach Infestation*
www.cdpr.ca.gov/docs/pestmgmt/pubs/roach_color.pdf

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INTEGRATED PEST MANAGEMENT: DUST

Dust can lead to health problems in children. Two health-related reasons to control dust in a child care center are:

1. To reduce dust mites that trigger asthma and allergies.
2. To reduce exposure to harmful toxins such as pesticides, lead, and flame retardants that collect in dust.

Dust mites

Dust mites are tiny insects that are too small to see. They live anywhere there is dust (for example, in carpets, bedding, upholstered furniture, and stuffed toys). Many children are allergic to the microscopic droppings of dust mites.

Chemical residues

Harmful chemical residues can settle in dust. Children are at risk of exposure since they spend more time playing on the floor where dust collects and frequently put their fingers in their mouths. The following chemicals can be found in dust:

- ▶ **Pesticides** can accumulate in dust. This can happen when pesticides are sprayed in or around the facility or when people who work with pesticides (for example, farm workers) bring residues inside on their clothing and shoes. See *Curriculum*, pages 8–9, for more information on the health hazards of pesticides.
- ▶ **Lead** can be found in dust and soil especially in facilities built before 1978. Lead poisoning leads to a variety of health and learning problems in children.
- ▶ **Brominated Flame Retardants** are often found in dust. Used for three decades to slow the burning of consumer products during a fire, new research shows these chemicals are harmful to human health. They're commonly found in children's nap mats, furniture, carpeting, and electronics.

1 HOW TO REDUCE DUST

- ▶ Use doormats to reduce dust tracked in from outdoors.
- ▶ Replace upholstered furniture with furniture that can be wiped clean.
- ▶ Avoid wall-to-wall carpeting. Use washable throw rugs on hard-surface floors, such as hardwood, linoleum, or tile.
- ▶ Store toys and books in enclosed bookcases, closed cabinets, and containers.
- ▶ Choose washable stuffed toys and wash them weekly and when visibly soiled. Wash them in hot water and dry thoroughly.

2 HOW TO REMOVE DUST

- ▶ Wipe dust from surfaces and objects using a damp cloth. Dry cloths just move the dust around rather than getting rid of it.
- ▶ Clean floors with a damp mop daily, not a broom.
- ▶ Don't allow children to lay their faces or blankets directly on carpeting.
- ▶ Wash sheets, blankets, and pillows once a week in hot water and dry in a hot dryer to kill dust mites.
- ▶ Vacuum carpets and area rugs frequently. Ideally, use a high efficiency particulate air (HEPA) vacuum. If you don't have a HEPA or HEPA-equivalent vacuum, use double-lined vacuum bags to reduce the amount of dust and dirt blown into the air while vacuuming.

NOTE: Clean when children are not present and provide fresh air by opening windows or turning on your ventilation system.

RESOURCES

- California Childcare Health Program (CCHP), *Asthma Triggers and How to Reduce Them*
cchp.ucsf.edu/Reduce_Asthma_Triggers

- California Environmental Protection Agency Air Resources Board, *Air pollution and contaminants at child-care and preschool facilities in California*
www.arb.ca.gov/html/fact_sheets/preschool_exposure.pdf

INTEGRATED PEST MANAGEMENT: FLIES



Are house flies buzzing around your face and landing on your food? Are fruit flies in the kitchen circling the bananas on the counter? There are safe and effective ways to keep fly numbers down and prevent them from bothering you. Integrated pest management (IPM) is a strategy to prevent fly invasions and reduce pesticide use.

When are flies a problem?

Although there are thousands of different flies, only a few are pests, and even these serve a useful purpose by breaking down and recycling dead plants and animals. **House flies** and related **filth flies** land on pet waste, garbage, and rotten fruit, and then walk on your food. Filth flies land on your food when you're eating outdoors. **Fruit flies** feed on tiny yeasts present on ripe and rotting fruits and food scraps. They breed outdoors and around overripe fruit or compost piles. These flies can spread germs to our food directly from garbage, rotten meat or fruit, dead animals, animal waste, or even dirty floors.

Fly life cycle

All flies have four life stages. The female house fly lays several batches of eggs in manure or garbage. The eggs hatch into maggots, which are pale and wormlike. Each maggot transforms into a cocoon-like pupa and from these emerge adult flies. During the hottest summer months, flies go from egg to adult in just a week. Outdoors, the shiny, metallic green or blue filth fly also develops from egg to adult in a week, which is why your garbage should be picked up by a collection service every week even if the outdoor bin isn't full.

IPM Strategies

1 DON'T SPRAY!

Spraying pesticides or using no-pest strips treated with pesticides won't kill the thousands of maggots outdoors hiding in garbage or soil. Both will expose staff and children to harmful chemicals.

2 KEEP FLIES OUT

House and filth flies

If flies are getting into your house, repair screens and keep unscreened outdoor kitchen doors and windows closed.

Fruit flies

It's hard to keep fruit flies out because they're so widespread outdoors and will find their way to the kitchen through open doors, or they will come in as eggs from fruit and vegetables.

3 REMOVE FLIES' FOOD AND SHELTER

House and filth flies

- ▶ Clean dirty dishes, utensils, and surfaces at the end of each day.
- ▶ Keep indoor garbage in covered waste cans that you empty every night.
- ▶ Keep outdoor garbage in tightly covered waste bins. If food residues collect and you notice maggots, wash the bin out with soap and water.
- ▶ Move outdoor garbage as far away from the kitchen as possible.
- ▶ If classroom pets are present, keep cages clean. Remove waste and change water frequently.

Fruit flies

- ▶ Keep ripe fruit and vegetables refrigerated.
- ▶ Use mesh food tents for ripening bananas or tomatoes on counter.
- ▶ Keep food scraps for compost in a covered container that you empty every night.
- ▶ Cover outdoor compost heaps.

[IPM Strategies continued]

4 MANAGE FLIES WITH TRAPS

House and filth flies

- ▶ Purchase a wall sconce fly trap. These light fixtures, commonly seen at grocery stores and restaurants, have a light to attract flies and sticky paper to capture them.
- ▶ Use a fly ribbon or fly paper, which both use fly attractant and a strong adhesive to trap flies. Note: these are different from no-pest strips containing dichlorvos, a highly toxic pesticide.
- ▶ Use an ultraviolet light trap.

Fruit flies

- ▶ Use cone traps. You can make your own by pouring some apple cider vinegar in a jar and adding a bit of dish soap. Make a cone out of paper and stick it in the jar. You don't want the paper to touch the liquid.

ACTION PLAN FOR FLIES

WHEN TO TAKE ACTION	NONPESTICIDE PRACTICES		LAST RESORT
<ul style="list-style-type: none"> ▶ When you see flies indoors, especially in the kitchen. ▶ When you see a lot of flies around garbage bins outdoors. 	House and filth flies <ul style="list-style-type: none"> ▶ Fix broken door and window screens and remove garbage daily. ▶ Use a fly swatter. ▶ Hang sticky fly paper or fly ribbons. ▶ Use a store-bought or homemade fly trap. 	Fruit flies <ul style="list-style-type: none"> ▶ Use a store-bought or homemade vinegar trap indoors. ▶ Outside, don't let fruit rot on the ground. 	<ul style="list-style-type: none"> ▶ If you suddenly see a lot of flies indoors, contact a pest management professional and consider asking them to look for a dead animal such as a mouse or rat.

LESS COMMON SITUATIONS

Fungus gnats feed on organic matter in soil and appear indoors when house plants are overwatered. They can be annoying when they buzz around your face.

- ▶ Don't overwater potted plants.
- ▶ Repot plants that get infested. Pour infested soil into your garden, wash out the pot, let it dry, and then replant with fresh potting soil.

Drain flies, also known as moth flies, gather on bathroom or kitchen walls. The maggots feed on the slime inside sewers and shower and sink drains. When the slime builds up, some of the adult flies fly out, gather around the drain, and sometimes fly to kitchen counters. They can carry germs from the slime to the counter.

- ▶ Use screened traps on bathroom drains to prevent buildup of hair.
- ▶ Keep kitchen drains clear with baking soda and vinegar followed by boiling water.
- ▶ Use drain cleaners once a month that contain special enzymes. (You'll find enzyme-containing drain cleaners at hardware stores. They're very effective and less toxic than drain cleaners that contain lye or bleach).

RESOURCES

- University of California Statewide IPM Program: *Flies*
www.ipm.ucdavis.edu/PMG/PESTNOTES/pn7457.html

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INTEGRATED PEST MANAGEMENT: GOPHERS



Pocket gophers, often just called gophers, are rodents that get their name from their cheek pockets, used for carrying food.

Why are gophers a problem?

Gophers often invade yards and gardens and feed on garden plants, vines, shrubs, and trees. One gopher can build up several mounds of soil in a day from its burrowing activities. These mounds are a tripping hazard for children.

What do gophers do?

Gophers live in a tunnel system that they dig. They're active year-round and at all hours of the day. They usually live alone in their tunnels, except when females are caring for their young or during the breeding season (late winter to early spring).

IPM Strategies

The sooner you detect gophers and do something about them, the better.

1 PROBE FOR BURROWS

Successful trapping or baiting depends on accurately locating the gopher's main burrow. To locate the main burrow, use a gopher probe. You can buy or make one using a pipe and metal rods. To find burrows, locate fresh mounds that are visible above ground. These are the plugged opening of cross tunnels.

You'll find the main burrow about 8 to 12 inches from the plug side of the mound, it's usually 6 to 12 inches deep. When the probe hits the gopher's burrow, you'll notice a sudden drop of about 2 inches. You may have to probe repeatedly to locate it.

2 USE TRAPS

Several types of gopher traps are available. The most common is a two-pronged, pincher trap. To set traps, first locate the main tunnel (see above). Then, use a shovel to open the tunnel wide enough to set traps in pairs facing opposite directions. Check traps often and reset as needed. If you haven't captured a gopher within two days, reset the trap in a different location.

3 PROTECT PLANTS WITH UNDERGROUND FENCING

Lay hardware cloth or $\frac{3}{4}$ -inch poultry wire under raised beds or lawns before planting.

4 MANAGE

Monitor regularly for re-infestation. If you need to use a rodenticide, contact a pest management professional.

ACTION PLAN FOR GOPHERS

WHEN TO TAKE ACTION	NONPESTICIDE PRACTICES		LAST RESORT
<ul style="list-style-type: none"> ▶ When you notice gophers or mounds. Gopher mounds are horseshoe shaped and the entrance is usually off to the side. 	<ul style="list-style-type: none"> ▶ Create buffer around perimeter of yard by removing weedy areas. ▶ Use traps. 	<ul style="list-style-type: none"> ▶ Underground hardware cloth or poultry wire, buried at least 2 feet deep. 	<ul style="list-style-type: none"> ▶ Contact a pest management professional.

RESOURCES

- University of California Statewide IPM: *Gophers*
www.ipm.ucdavis.edu/PMG/PESTNOTES/pn7433.html
www.ipm.ucdavis.edu/QT/gopherscard.html

- Gopher IPM at School Video
www.youtube.com/watch?v=pxezCNILIP8&index=8&list=PLgU4sA8HrUfrRUCWS-r1ZcXrZL9zXsrJ0e

INTEGRATED PEST MANAGEMENT: GROUND SQUIRRELS



Ground squirrels are brownish-gray rodents that forage above ground near their burrows. Ground squirrels are 9 to 11 inches long, not counting their bushy tail, which adds another 5 to 9 inches.

Why are ground squirrels a problem?

Ground squirrels damage garden plants and fruit and nut trees. They can also cause damage to building foundations, fences, and levee systems. Their burrows create tripping hazards.

Ground squirrels can carry diseases harmful to humans. A major concern is bubonic plague, transmitted to humans from the fleas that the squirrels carry. If you find squirrels or other rodents dead for no reason, notify public health officials.

What do squirrels do?

Ground squirrels live in colonies in burrow systems where they sleep, rest, rear young, store food, and avoid danger. They are active during the day, mainly midmorning through late afternoon, especially on warm, sunny days.

IPM Strategies

1 USE TRAPS

Traps work best between February and October when ground squirrel numbers are low to moderate.

Use a trap that kills since it's illegal to release trapped squirrels elsewhere.

Types of kill-traps include:

- ▶ **Box traps**—place box-type traps in a covered box with a 3-inch diameter entrance to reduce hazards to children and pets.
- ▶ **Tunnel traps**—place on the ground near squirrel burrows or runways and bait them with walnuts, almonds, oats, barley, or melon rinds.
- ▶ **Conibear traps**—Place the trap directly in the burrow opening, so the squirrel must pass through it, tripping the trigger.

Inspect traps once a day and remove dead squirrels with protective gear. You can use plastic bags slipped over your arms as gloves. Hold the animal with one hand and slip the plastic bag inside out over the animal and off your hand.

2 HIRE A PEST MANAGEMENT PROFESSIONAL (PMP)

A PMP will know how and when to use toxic baits and fumigants (gas cartridges). While these products are available at local hardware and home improvement stores, they can still seriously harm or kill children when not handled by PMPs.

ACTION PLAN FOR GROUND SQUIRRELS

WHEN TO TAKE ACTION	NONPESTICIDE PRACTICES	LAST RESORT
<ul style="list-style-type: none"> ▶ When you notice ground squirrel burrows. Burrows are about 4 inches in diameter and are not plugged. 	<ul style="list-style-type: none"> ▶ Remove brush piles and debris. ▶ Destroy old burrows. ▶ Use traps. 	<ul style="list-style-type: none"> ▶ Hire a pest management professional to use baits or fumigate.

RESOURCES

- University of California Statewide IPM: *Ground squirrels*
www.ipm.ucdavis.edu/PMG/PESTNOTES/pn7438.html

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INTEGRATED PEST MANAGEMENT: HEAD LICE

Head lice are bloodsucking insects that are commonly spread among children. Young children are especially prone to getting head lice, because they

- ▶ play together with close physical contact.
- ▶ nap close together.
- ▶ hug often.
- ▶ share hats, helmets, combs and brushes.

Having head lice is not related to hygiene, socioeconomic status or ethnic background.

When are head lice a problem?

Head lice do not transmit any infectious diseases; they are just bothersome to their hosts and cause itching. Head lice are a problem because it takes time for parents to treat and remove head lice from their child's hair, and clean clothing and bedding.

Habits and life cycle

Head lice spend their whole life on the hairy part of the head. An adult head louse is about the size of a sesame seed. It has six legs with claws to grab onto hair, is wingless, and ranges from tan to gray in color. Adult lice are often seen in the hair behind the ears and nape of the neck. Lice eggs, called nits, are laid on the head, close to where the scalp and hair shaft meet, because they need warmth in order to hatch.

Depending on hair type, nits that are more than half an inch from the scalp are usually hatched and empty. Unlike dandruff, nits are hard to remove. To remove a nit, pull it along to the end of the hair or use a special fine-toothed lice comb. You can't just pick them off. Live head lice move fast, so they're more difficult to spot than nits.

- ▶ Female adult lice produce up to 10 eggs per day.
- ▶ Nits remain on the hair shaft and hatch after a week.
- ▶ 7 to 14 days after the nits hatch they mature into adults that can lay their own eggs, repeating the life cycle.
- ▶ Head lice can live about a month on their human host.

Characteristics

- ▶ Head lice can crawl very quickly, but do not hop, fly or jump.
- ▶ Head lice spread from direct contact between children, or through sharing of combs, brushes, scarves, hats, ponytail elastics or bed linens.
- ▶ Head lice cannot live on family pets.

IPM strategies

1 LIMIT THE SPREAD OF HEAD LICE

A well-organized and prompt response to the first few cases can prevent a widespread problem.

- ▶ Children and staff should avoid head-to-head contact during an infestation. Transmission most often occurs through direct contact with the head of an infested individual.
- ▶ Avoid sharing combs, brushes, hats and helmets with others.
- ▶ Check all children and other close contacts of a child with head lice. Children with evidence of an active infestation should be treated. Simultaneous treatment of all infested children is necessary to prevent spread back to previously treated children.

2 EDUCATE PARENTS ABOUT MONITORING AND MANAGEMENT OF HEAD LICE

To prevent the spread of head lice when a case occurs in the child care program:

- ▶ Educate parents regarding the importance of following through with treatment recommendations at home and to notify the program if head lice have been found on any household member. Refer to the California Childcare Health Program Fact Sheet for Families on Head Lice.
- ▶ Caregivers and parents should learn to recognize nits and regularly check children's hair when there is a known case of head lice in the program.



[IPM strategies continued]

- ▶ Lice and nits can be removed using a fine-toothed lice comb (a pet flea comb may also work).
- ▶ Wet-combing and occlusive methods (like petroleum jelly or dimethicone lotion) are safe ways to manage head lice.
- ▶ Although head lice are not able to survive off of humans for more than a few days, it is recommended to wash clothes (including hats and scarves) and bedding in very hot water, and vacuum carpets and upholstered furniture in rooms used by persons with head lice. Combs and hair brushes may be soaked in hot (149° F (65° C)) water for at least one hour.

Children with head lice should not be excluded

Children should not be sent home early from childcare or school because of head lice. Parents of affected children should be notified and informed that their child must be properly treated before returning to school the next day. Other close contacts should be checked to determine if there are other cases. If your facility is having a problem with head lice, you should conduct morning “head checks” before the children socialize together.

“No-nit” policies requiring that children be free of nits before they return to child care are not recommended. Regardless of the policy, children need to be checked for new nits for ten days after treatment.

Remember, if lice or nits are found, all family members, children and staff should be inspected. ECE programs need to work together with families to control an infestation.

ACTION PLAN FOR HEAD LICE

WHEN TO TAKE ACTION	LIMIT THE SPREAD	EDUCATE PARENTS	BE SAFE
<ul style="list-style-type: none"> ▶ When you discover nits or head lice on hair shafts. 	<ul style="list-style-type: none"> ▶ Transmission most often occurs through direct head-to-head contact with an infested individual. ▶ Perform a well-organized and prompt response to the first few cases to prevent further infestation. 	<ul style="list-style-type: none"> ▶ Educate parents about detecting and managing head lice. 	<ul style="list-style-type: none"> ▶ Never try to eliminate a lice infestation by spraying a pesticide around a room, or on bedding, clothing or stuffed animals. ▶ Never use a fogger to treat a room for lice. Pesticide sprays and fumes will endanger children and won't kill the lice.

RESOURCES

University of California Statewide IPM Program: *Head Lice*
www.ipm.ucdavis.edu/PMG/PESTNOTES/pn7446.html

American Academy of Pediatrics: *Head Lice*
pediatrics.aappublications.org/cgi/content/full/126/2/392

California Childcare Health Program: *What Child Care Providers Should Know About Head Lice*
https://cchp.ucsf.edu/sites/cchp.ucsf.edu/files/HeadLice_En0910_0.pdf

Kids Health

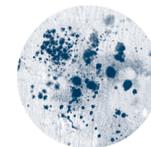
kidshealth.org/parent/infections/common/lice.html

eXtension School Integrated Pest Management Action Plans
www.extension.org/pages/School_Integrated_Pest_Management:_Action_Plans

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INTEGRATED PEST MANAGEMENT: MOLD

Mold and mildew are fungi found indoors and outdoors. Mold grows where there's a lot of moisture in the air, or when leaks or condensation cause surfaces, furnishings or building materials to be damp. We often clean up the mold, but don't fix the source of the problem and so the mold returns. It's important to take the steps to minimize moisture.

When is mold a problem?

Mold can trigger asthma, allergic reactions and other respiratory problems for children and staff. These reactions can be immediate or delayed.

Characteristics and habits

Mold grows anywhere moisture is present. It produces spores to reproduce and grow. These spores travel through the air until they settle on a moist, humid place. In buildings, mold may be found around windows, walls or ceilings if there are leaks or condensation problem. Mold is also common in bathrooms and damp areas under sinks. You can detect mold by its musty smell or dark stains on walls or underneath sinks.

IPM strategies

1 KEEP MOLD AWAY BY REMOVING MOISTURE

- ▶ Inspect regularly for water droplets collecting on walls or windows.
- ▶ Open windows to increase air circulation.
- ▶ Use exhaust fans in bathrooms, and when cooking, dishwashing and cleaning.
- ▶ Be sure that stoves, dryers and other moisture sources vent to the outside.
- ▶ Systematically clean the facility. Remember to clean roof gutters and air conditioning drip pans.
- ▶ Take action within 48 hours when you see damp or wet building materials or furnishings. If wet or damp areas are dried within 24–48 hours, mold usually won't grow.

- ▶ Fix leaks and other water problems immediately.
- ▶ Install carpets away from moisture-prone areas.

2 MONITOR FOR MOLD

Check the following places for mold:

- ▶ Ceilings and walls, especially exterior walls
- ▶ Surface of walls behind furniture (condensation can occur because there is less ventilation)
- ▶ Underside of carpets and pads
- ▶ Under sinks and around pipes (leaks or condensing pipes)
- ▶ Heating ducts

3 GET RID OF MOLD

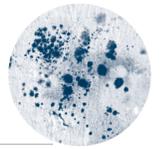
- ▶ You can clean up the problem if it's small (a 3x3 feet patch).
- ▶ If the heating, ventilation or air conditioning system has mold present, don't use it and read EPA's guide *Should You Have the Air Ducts in Your Home Cleaned?* (www.epa.gov/iaq/pubs/airduct.html)

4 BEFORE CLEANING MOLD

- ▶ Wear a mask, such as the N-95 respirator available at hardware stores.
- ▶ Wear gloves that cover your arms too.
- ▶ If you are cleaning a ceiling area, wear goggles in case there are drips.
- ▶ Wear long sleeves and pants.

5 ONCE YOU'RE READY TO CLEAN

- ▶ Scrub the mold off with detergent and water.
- ▶ Completely dry the area.
- ▶ Replace absorbent materials like ceiling tiles and carpets.



[IPM strategies continued]

- ▶ If mold has grown on an expensive or sentimental item, consult a specialist in furniture repair, art restoration, carpet cleaning or water restoration.

6 GET RID OF MOISTURE

Once you've removed the mold itself, make sure to get rid of whatever caused the moisture in the first place (i.e., leaking pipes or indoor humidity). By eliminating the source of moisture, you'll prevent future mold problems.

If you suspect a problem is too big for you to clean up, hire a professional.

ACTION PLAN FOR MOLD

WHEN TO TAKE ACTION	FIRST, PROTECT YOURSELF	SECOND, ELIMINATE THE MOLD	THIRD, FIX THE MOISTURE PROBLEM
<ul style="list-style-type: none"> ▶ When you see or smell mold or mildew growing. 	<ul style="list-style-type: none"> ▶ Inspect thoroughly to identify where the mold problem is present. 	<ul style="list-style-type: none"> ▶ Scrub the mold off with detergent and water and completely dry the area. ▶ If the mold problem is too big, hire a professional. 	<ul style="list-style-type: none"> ▶ Eliminate the source of moisture. ▶ If it is too difficult to fix yourself, hire a professional.

RESOURCES

Environmental Protection Agency—*Mold Resources*
www.epa.gov/mold/moldresources.html
 Center for Disease Control—*Mold*
www.cdc.gov/mold

EPA's guide *Should You Have the Air Ducts in Your Home Cleaned?*
www.epa.gov/iaq/pubs/airduct.html
 The California Department of Pesticide Regulation, IPM in Child Care
apps.cdpr.ca.gov/schoolipm/childcare

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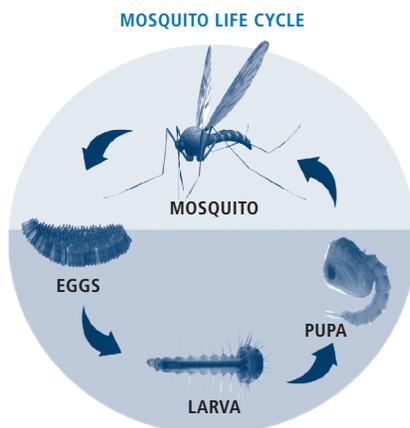
INTEGRATED PEST MANAGEMENT: MOSQUITOES



Mosquitoes are small flying insects. The females bite because they need blood to nourish their eggs. While mosquitoes can carry diseases and their bites are annoying, they also provide food for fish, birds, and bats.

When are mosquitoes a problem?

Mosquito bites can cause allergic reactions, pain, irritation, redness, and itching. Mosquito bites can get infected when children scratch them with dirty fingers. Mosquitoes can also carry diseases such as dengue fever, malaria, and West Nile virus.



Mosquitoes go through several stages. Female mosquitoes lay their eggs in or near standing water in puddles, neglected swimming pools, tree holes, and even old tires (such as those used for tire swings). The mosquito larvae, or wigglers, swim in this water and soon develop into pupae. The pupae then transform into winged adults, which fly away and live for about a week.

How do mosquitoes find you?

Female mosquitoes bite people, pets, and livestock. They detect chemicals in your sweat and heat from your body. Most mosquitoes come out at dusk, although some are active during the day.

IPM Strategies

It's impossible to completely eliminate mosquitoes. The goals are to keep mosquitoes from coming indoors and prevent them from biting us. Sprays and bombs don't necessarily keep mosquitoes away and they expose children and staff to pesticides and solvents.

1 KEEP MOSQUITOES OUT TO PREVENT MOSQUITO BITES

- ▶ Cover windows and doors with mesh screens.
- ▶ Avoid being outdoors at dusk or when mosquitoes are active.
- ▶ Wear long sleeves, long pants, and socks when you're outdoors.
- ▶ Try keeping mosquitoes away using an electric fan outdoors or a ceiling fan under enclosed porches. Keep fans and cords out of children's reach.

2 REMOVE STANDING WATER AND SHELTER

Cut down tall grass and pull weeds where mosquitoes rest during the day. Drain anything that can hold water immediately after use or rain. Empty water that collects in cinder blocks, flower pot saucers, toys, old tires, crotches of trees, and other objects.

- ▶ Drain standing water (puddles) after a rainstorm.
- ▶ Change water in pet dishes, watering troughs, and bird baths every few days.
- ▶ Avoid overwatering lawns and gardens, which leads to puddles.
- ▶ Clean rain gutters at least once a year to remove debris.
- ▶ Fill open tree holes with sand or mortar.

[IPM Strategies continued]

3 ASSESS YOUR RISK

Check with a health care provider or your local public health department about the risk for illnesses spread by mosquitoes in your neighborhood. You can use repellents if mosquitoes are biting and you have to be outdoors. Follow the label directions. Keep away from eyes and the mouth. Get signed consent from parents before applying insect repellents on children. For a sample consent form: cchp.ucsf.edu/InsectPermissionForm

Some effective repellents are:

Picaridin (20% concentration) is odorless, doesn't feel greasy or sticky, and rarely irritates skin.

Oil of lemon eucalyptus (30% concentration) has a eucalyptus scent and is somewhat oily. Don't use it on children younger than 3 years.

IR3535 (20% concentration) is derived from natural materials. Does not last as long as picaridin or lemon eucalyptus.

Products containing DEET are also effective, but may be more toxic at high doses. If you decide to use DEET, stick to products that have a concentration between 10% to 30%. Always follow the directions on the label. Do not use DEET on children under 2 months.

ACTION PLAN FOR MOSQUITOS

WHEN TO TAKE ACTION	NONPESTICIDE PRACTICES	LEAST HARMFUL PESTICIDE	LAST RESORT
<ul style="list-style-type: none"> ▶ When mosquitoes bite. ▶ When you notice standing water. 	<ul style="list-style-type: none"> ▶ Keep window screens in good repair. ▶ Wear long pants and sleeves. ▶ Eliminate standing water. ▶ Use a fly swatter or newspaper to individually kill mosquitoes. 	<ul style="list-style-type: none"> ▶ Use insect repellents safely, according to label directions. 	<ul style="list-style-type: none"> ▶ Contact your vector control district (see below).

LESS COMMON SITUATIONS

If you have a lot of mosquitoes, they are best managed by vector control districts. In California, there are more than 50 districts, all of which provide free services. Call the California Mosquito and Vector Control Association at (916) 440-0826 to find your local district. You can report a mosquito problem, potential mosquito breeding source, or ask a professional to visit.

RESOURCES

- University of California Statewide IPM Program: *Mosquitoes*
www.ipm.ucdavis.edu/PMG/PESTNOTES/pn7451.html
- Mosquito and Vector Control Association of California
www.mvacac.org
- U.S. EPA: All About Mosquitoes
www2.epa.gov/mosquitocontrol
- American Academy of Pediatrics, Healthychildren.org, Choosing an Insect Repellent for Your Child, 2012
www.healthychildren.org/English/safety-prevention/at-play/Pages/Insect-Repellents.aspx

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INTEGRATED PEST MANAGEMENT: RATS AND MICE



The most common rodent pests are the roof rat, Norway rat, and house mouse. To protect the health of children and staff, you need a strong IPM program to manage rats and mice.

When are rats and mice a problem?

Rats and mice can damage buildings, food, clothing, and documents by gnawing, urinating, defecating, and nesting. Because they gnaw on hard objects, such as plastic electrical boxes, they can cause fires. Rats bite more than 4,000 people a year, mostly young children. The urine, droppings, saliva, and dead skin cells of rats and mice may also trigger asthma attacks.

What do rats and mice do?

Rats often live in packs, so if you see one, there are likely to be more around. Rats and mice reproduce often. If not properly managed, a rodent infestation will rapidly increase. Mice are 10 to 20 times more common than rats in indoor environments. Rats and mice are most active at night. If you see them during the day, you probably have a serious infestation.

IPM Strategies

Many people use poisons to get rid of rodents, but this won't solve a rodent problem without a comprehensive IPM plan. If rodents are killed, but food, water, and a place to live are still available, it's likely that other rodents will soon appear.

1 KEEP RATS AND MICE OUT

Rodents enter buildings through holes in walls, around pipe entries, through sewer outlets, and under doors. Mice can fit through a hole as small as ¼-inch. Rats fit through a hole as small as ½-inch.

- ▶ Use metal flashing, hardware cloth, copper wool, and escutcheons to seal floor drains, vents, holes, and gaps around pipes.
- ▶ Install a doorsweep under each exterior door.
- ▶ Seal cracks in the foundation and openings to keep rodents from entering the building.

2 REMOVE FOOD

In most areas, garbage is the main source of food for rats.

- ▶ Discard food waste in indoor and outdoor eating areas in tightly covered, indoor garbage cans lined with plastic bags.
- ▶ Clean indoor garbage cans frequently to prevent the build-up of food waste.
- ▶ Keep outdoor garbage bins on hard concrete surfaces away from the building.

3 MONITOR

Look for:

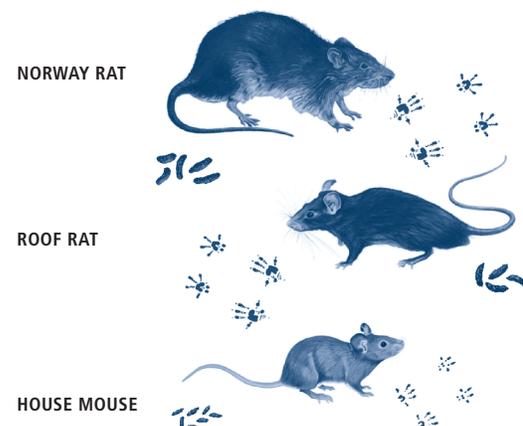
- ▶ rodent droppings,
- ▶ burrows in the ground,
- ▶ nests in ivy or around cluttered areas,
- ▶ fruit or nuts that have been gnawed or damaged food in pantry.

4 IDENTIFY WHAT KIND OF RODENT YOU HAVE

Norway rats are the best burrowers and stay in the basement or ground floor.

Roof rats are clever climbers and like enclosed elevated spaces in attics, walls, and false ceilings.

House mice can run up any rough, vertical surface and nest in enclosed places such as drawers and boxes.



[IPM Strategies continued]

5 GET RID OF RATS AND MICE

Traps

- ▶ Use snap or electrocution traps with bait.
- ▶ Keep traps away from children's reach.
- ▶ Always wear gloves when handling traps to protect yourself.
- ▶ Read directions and watch instructional videos about using the traps.

Snap traps

- ▶ Place traps parallel to the wall so rodents will be caught coming from either direction.
- ▶ Use a lot of traps to make the trapping period short. Empty and reset traps daily until there are no more rodents.
- ▶ Rats: Put the traps out for one or two days so the rats are used to them and then use baits, such as peanut butter.
- ▶ Mice: Place mouse traps no more than 10 feet apart in areas where mice have shelter and food.

Electrocution traps

- ▶ They are easy to use, battery-operated, shoebox-sized traps that electrocute the rodent as it crawls in.

- ▶ Place dried fruit in the back of the trap, press a switch, and go away. A blinking light will alert you that a rodent's been electrocuted.
- ▶ Dispose of the dead rodent in an outdoor garbage bin.
- ▶ One trap can be reused indefinitely.

6 CLEAN UP AFTER RATS AND MICE

- ▶ Don't sweep or vacuum rodent droppings, urine, or nesting materials; they can carry diseases. Sweeping or vacuuming will stir up dust and increase your chance of inhaling viruses.
- ▶ Wear gloves and disinfect the urine and droppings. (If using bleach, spray with a mixture of 1 part bleach to 10 parts water. Let soak 5 minutes.) See *Green Cleaning, Sanitizing, and Disinfecting* handout for safer alternatives to bleach.
- ▶ Use a paper towel to pick up the urine and droppings and dispose of them in the garbage.
- ▶ Mop floors with a disinfectant.
- ▶ Remove and dispose of gloves and wash hands.

ACTION PLAN FOR RATS AND MICE

WHEN TO TAKE ACTION	NONPESTICIDE PRACTICES	LAST RESORT
<ul style="list-style-type: none"> ▶ If you see a rodent, or any evidence of rats and mice such as droppings or chewed wires. 	<ul style="list-style-type: none"> ▶ Clean up cluttered areas. ▶ Sanitize and keep things clean. ▶ Seal all cracks and openings that are bigger than ¼-inch. 	<ul style="list-style-type: none"> ▶ Identify rodent pathways by looking for rub marks or trails of urine. ▶ Use snap or electrocution traps (such as a Raticator™) and make sure they're out of children's reach.
		<ul style="list-style-type: none"> ▶ Contact a pest management professional to help with traps. Do not use rodenticide baits.

LESS COMMON SITUATIONS

House mice may spread lymphocytic choriomeningitis, a viral disease that causes inflammation of the membrane that surrounds the brain and spinal cord. The disease can be transmitted from pregnant women to their unborn infants, and is an under-recognized cause of hydrocephalus (a buildup of fluid in the brain) in newborns. Mice can also cause salmonellosis, a form of food poisoning.

RESOURCES

- DPR Pest Management & Licensing Branch—Frequently Asked Questions about Rodents and Rodenticides
www.cdpr.ca.gov/docs/dept/factshts/faq_rodents_rodenticides.pdf
- University of California Statewide IPM Program: *Rats*
www.ipm.ucdavis.edu/PMG/PESTNOTES/pn74106.html
- DPR Pest Info, IPM for Schools—Preventing Mice and Rats from Invading Your School
www.cdpr.ca.gov/docs/pestmgt/pubs/rats_color.pdf
- eXtension Integrated Pest Management Action Plan for Rodents
www.extension.org/pages/63911/ipm-action-plan-for-rodents#.VfiA1fVg4k

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INTEGRATED PEST MANAGEMENT: SPIDERS

Spiders are beneficial predators of pests such as mosquitoes and house flies. Most spiders are harmless. The few spiders that might hurt humans, such as black widows, spend most of their time hidden under woodpiles or in crevices. Brown recluse spiders do not live in California.

When are spiders a problem?

Children are very curious, and typically play on the floor or ground, which puts them at a higher risk for rare encounters with spiders. Spiders usually leave people alone unless provoked, and almost all bites blamed on spiders come from mosquitoes, biting flies or fleas.

Spiders cannot transmit diseases. Only a few have jaws strong enough to bite through skin, and these spiders can inject toxin that may cause illness. Certain spider bites can sicken young children due to their small body size and weight. A serious infection, Methicillin-resistant *Staphylococcus aureus* (MRSA), is not a spider bite but looks like one. Only a health care provider can distinguish them.

Characteristics

Spiders are arachnids, close relatives of insects, and have eight legs and two body parts—the head and abdomen.



Black widow spiders are common in California. The female has a shiny black body with a bright orange-red hourglass shape on the bottom of her abdomen. She's usually less than ½ inch long—about the size of your thumbnail.

Male black widow spiders are smaller than females and lighter in color. Their mouthparts are too small to bite humans.

Black widows are most active in the warmer months. They live in dark, warm, dry and sheltered areas such as garages, sheds, wood piles, stone piles and hollow wood stumps. They're found under play structures, in hollow areas of children's toys and under picnic tables and benches, especially in corners.

Other spiders, such as the common house spider, are harmless and often found in corners of a house, basement or a garage where they make their cobwebs.

Habits

Only full-sized black widow females bite humans, and only if threatened or if their web is disturbed. If bitten, the reaction can be mild to painful. Death is very unlikely, but infections are common. If bitten, wash the area with warm water and soap, apply an ice pack and contact a health care provider or poison control center (1-800-8-POISON) immediately.

IPM strategies

Most spiders are beneficial and harmless to humans. Since spiders eat other pests, leave them alone, especially if you find them outdoors. If you need to remove a spider indoors, use an empty plastic container and slide a stiff piece of paper over the container's top.

1 KEEP SPIDERS OUT

- ▶ Install screens.
- ▶ Minimize hiding places and regularly clean cobwebs with a cobweb brush (for example, a "Webster"), or vacuum indoors.
- ▶ Seal cracks in the foundation and openings to keep spiders from entering the building.

2 REMOVE SPIDERS' FOOD, WATER AND SHELTER

- ▶ Change outside light bulbs that attract flying insects that are food for spiders. Yellow light bulbs are slightly less attractive to these insects.
- ▶ Vacuum, dust and sweep regularly.
- ▶ Keep vegetation, especially ivy, at least 12 inches away from the building's foundation.

3 MONITOR

- ▶ Indoors, spiders are commonly found in either very dry or very moist areas, in dark corners and crevices where they make webs. Indoor cobwebs are an indication that spiders are present and where they are hiding.



[IPM strategies continued]

- ▶ Not every web houses a spider—once a web is abandoned, another spider doesn't move in. Also, check outdoor playground equipment, benches and picnic tables.

4 GET RID OF SPIDERS

- ▶ Traps and insecticides don't work to manage spiders. Spraying is usually not recommended because it won't kill spiders and leaves residues that may harm children and the environment. Insecticides work only if you are able to directly spray the spider.

- ▶ A less toxic way to manage spiders is simply to move them outside, vacuum them up, crush them with your shoe or smash them with a rolled up piece of paper.
- ▶ To remove individual spiders, place a jar over them and slip cardboard underneath to seal off the opening. Then, take the spider outside.
- ▶ Use a cobweb brush or Webster (an effective cleaning tool which extends to over 5-feet long) to clean ceilings and corners.

ACTION PLAN FOR SPIDERS

WHEN TO TAKE ACTION	NONPESTICIDE PRACTICES	LAST RESORT
<ul style="list-style-type: none"> ▶ When you see spiders in your center. 	<ul style="list-style-type: none"> ▶ Keep your center clean. ▶ Trap individual spiders in a jar or plastic container and release outside. ▶ Vacuum the spiders, cobwebs and egg sacs. ▶ Screen windows. ▶ Seal cracks and openings. 	<ul style="list-style-type: none"> ▶ Consult with a pest management professional (PMP) if spiders are a concern after regularly using a cobweb brush and vacuum cleaner. A PMP can spray spiders directly only as a temporary solution. PMPs can apply dusts containing silica gel and pyrethrins, which may be useful in certain indoor situations.

<p>RESOURCES</p> <p>University of California Statewide IPM Program: <i>Spiders</i> www.ipm.ucdavis.edu/PMG/PESTNOTES/pn7442.html</p>	<p><i>Our Water, Our World: Living with Spiders, The Helpful Hunters</i> www.ourwaterourworld.org/Portals/o/documents/pdf/Spiders%2009.pdf</p>
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INTEGRATED PEST MANAGEMENT: SLUGS AND SNAILS



When are snails and slugs a problem?

Snails and slugs are harmless to humans, but they can be pests in the garden. They feed on plants by making holes in the leaves, devouring seedlings and eating low-growing fruit such as strawberries. In ECE programs, children may find them in the garden or on the sidewalks, pick them up, play with them and even eat them.

Characteristics and habits

Snails have an outside spiral shell that protects their bodies, while slugs don't have a shell. Both can vary in size from a small speck to a few inches long. They move by gliding and leaving a slime trail where they've been.

Snails and slugs hide during the day and come out at night to eat since they don't like heat and bright light. They're also active on cloudy or foggy days. They hide under boards, stones, garden debris, grassy or weedy areas, leafy branches close to the ground or in any other cool, moist area. In cold weather, they hibernate in the soil. During hot, dry periods, snails seal themselves off and attach themselves to fences, tree trunks or walls.

IPM strategies

You may have an abundance of snails and slugs if seedlings suddenly disappear, leaves develop irregular holes, slime trails cover walls and walkways or you see snails or slugs gliding across lawns or sidewalks early in the morning.

1 KEEP SNAILS AND SLUGS OUT OF GARDENS

- ▶ Eliminate daytime hiding places by turning over boards or rocks.
- ▶ Grow vegetables and susceptible plants and flowers in the sunniest place possible to avoid snails and slugs hiding in shady areas.

- ▶ Use copper barriers around planting beds and trees to give snails and slugs an electric shock. They'll stop in their tracks and turn around rather than cross the copper to succulent food.

2 REMOVE SNAILS' AND SLUGS' FOOD, WATER AND SHELTER

- ▶ Choose snail-proof plants such as:
 - ▷ Impatiens, geraniums, begonias, lantana and nasturtiums
 - ▷ Plants with stiff leaves such as sage, rosemary and lavender
- ▶ Use drip irrigation instead of sprinkler irrigation to reduce humidity and moisture. Drip irrigation reduces excess water by bringing water directly to the roots of plants and lawns.

3 REDUCE THE POPULATION

- ▶ Handpicking snails and slugs
 - ▷ Water the infested area in the late afternoon.
 - ▷ Once dark, put on gloves and use a flashlight to find snails or slugs.
 - ▷ Discard snails or slugs
 - Place them in a plastic bag and dispose of them in the trash.
 - Drown them in a bucket with soapy water and dispose of them in your compost pile once dead.
 - Crush them and leave them in the garden.
 - Remove snails from undersides of wooden decks, meter boxes or low ledges on fences.

Take live snails to a duck pond. Snails are much better for ducks than bread. Make sure you haven't baited the snails—you wouldn't want to poison the ducks.



[IPM strategies continued]

4 TRAPS

- ▶ Build wooden traps in landscape areas using 8 inch x 15 inch boards raised off the ground by 1-inch runners. Scrape off and remove snails daily.
- ▶ Sugar water and yeast mixed together in a plastic container will also attract snails and slugs. Make sure to have deep, vertical sides to keep snails and slugs from crawling out. Scrape off and remove them daily.

If you have a lot of snails or slugs, repeat this daily. After a few days, most will be gone, then monitor weekly.

5 BAITS

- ▶ Never use baits that contain metaldehyde—they're extremely poisonous to children, dogs and birds. Instead, use baits that contain iron phosphate, which are relatively safe. Be sure to follow label directions.
- ▶ Water before applying baits and apply in warm evenings when snails and slugs are active.
- ▶ Spread bait in moist areas, like sprinklers, where snails and slugs travel.

ACTION PLAN FOR SLUGS AND SNAILS

WHEN TO TAKE ACTION	NONPESTICIDE PRACTICES	LEAST HARMFUL PESTICIDE	LAST RESORT
<ul style="list-style-type: none"> ▶ When you see snails or slugs, their slime trails, or leaves with a lot of irregular holes. 	<ul style="list-style-type: none"> ▶ Eliminate daytime hiding places. ▶ Grow plants that snails and slugs like to eat in sunny areas where they are less likely to travel. ▶ Use copper barriers. ▶ Eliminate moisture by using drip irrigation. ▶ Grow plants that snails and slugs don't like to eat. ▶ Build wooden traps. 	<ul style="list-style-type: none"> ▶ Use iron phosphate baits. 	<ul style="list-style-type: none"> ▶ Consult with a gardener familiar with IPM.

RESOURCES

University of California Statewide IPM—*Snails and Slugs*
www.ipm.ucdavis.edu/PMG/PESTNOTES/pn7427.html

Our Water, Our World—*Controlling Snails and Slugs in Your Garden*
ourwaterourworld.org.dnnmax.com/Portals/o/documents/pdf/Snails%20and%20Slugs%2009.pdf





INTEGRATED PEST MANAGEMENT: YELLOWJACKETS

Yellowjackets are wasps that are sometimes called hornets or “meat bees,” although they aren’t bees at all. Yellowjackets are important in nature because they eat large numbers of caterpillars, house flies and other pest insects.

When are yellowjackets a problem?

Yellowjackets are problematic for children and adults when they search for food or defend their nests. Yellowjackets can be persistent and aggressive when searching for food, and are more likely to sting when swatted or when their nest is disturbed. If their nest is threatened, yellowjackets will defend it vigorously, and can sting repeatedly, unlike honey bees which sting only once.

If a child is stung by a yellowjacket:

- ▶ Move the child to a safe area to avoid more stings.
- ▶ Watch for allergic reactions to yellowjacket stings which can develop anywhere on the body. Life-threatening allergic responses require immediate emergency care.
- ▶ Pain is a common reaction to a sting that ranges from short-term, intense feelings of pain to swelling and tenderness with some itching.
- ▶ Other reactions to the sting may include hives, swelling, nausea, vomiting, abdominal cramps and headaches.
- ▶ Symptoms can occur immediately after a sting, or may take longer to appear. They can last for several hours.
- ▶ To treat a sting:
 - ▷ Wash with soap and water.
 - ▷ Apply ice to the area immediately to reduce the pain and swelling.
 - ▷ Apply a baking soda–water paste to reduce itchiness.
 - ▷ Call 911 if the person shows signs of a severe allergic reaction such as difficulty breathing or dizziness.

Unlike honey bees, yellowjackets rarely leave a stinger embedded in the skin.

Characteristics and habits

Yellowjackets are yellow and black. Yellowjacket nests:

- ▶ look like papery gray balls.
- ▶ are commonly built in holes in the ground, like rodent burrows.
- ▶ may be attached to eaves of buildings, undersides of decks, or tree branches.
- ▶ may be in empty spaces in walls or ceilings of buildings.
- ▶ are started in the spring by the queen.

From spring to midsummer, young yellowjackets are growing in the nest, and many of the new adults are out foraging for insect prey. By late summer, yellowjackets have switched from insect protein to become sugar-craving adults. They scavenge for sweet food around garbage cans, outdoor eating areas and where ripe or overripe fruit is present. In mild climate areas of California, some yellowjacket colonies survive for several years and become quite large.

IPM strategies

1 ELIMINATE NESTING SITES

- ▶ Plug up rodent burrows.
- ▶ Seal holes and cracks in foundations, walls, roofs and eaves.

2 REMOVE YELLOWJACKETS’ FOOD

- ▶ Remove attractive foods such as sugary drinks, ripe fruit, meat, pet food or garbage. Keep food covered and indoors. Once food is discovered, yellowjackets will continue to hunt around the area even after the food is removed.
- ▶ Use liners in garbage cans.
- ▶ Use garbage cans with domed-topped, spring-hinged lids (these are wasp-proof) in outdoor eating areas.
- ▶ Empty garbage daily and replace liners.
- ▶ Tightly cover recycling bins and clean daily.



[IPM strategies continued]

3 GET RID OF YELLOWJACKETS

Traps can reduce yellowjackets, but won't eliminate them if other food sources are available. Trapping needs to start in the spring and continue into summer and fall. Place traps at least 20 feet away from children and staff to avoid attracting yellowjackets to eating and play areas.

- ▶ **Lure traps** can be purchased and are easy to use. They work best as queen traps in late winter and early spring. In spring there is a 30–45 day period when new queens first emerge before they build nests. Each queen trapped at this time represents one less nest of 500–5,000 yellowjackets in the summer and fall. Lure traps contain a chemical bait. Meat can be added to the lure traps to improve trapping. ▶
- ▶ **Change chemical bait in lure traps every 6 to 8 weeks in spring and every 2 to 4 weeks in summer.**
- ▶ **Change bait more frequently when temperatures are high.**

- ▶ **Meat baits must be replaced more frequently because yellowjackets are not attracted to rotting meat.**
- ▶ **Periodically check the trap to remove trapped yellowjackets and make sure yellowjackets are still attracted to the trap.**

4 REMOVE YELLOWJACKETS' NEST

If the yellowjacket population persists after trapping and removing attractive food, it may be necessary to locate and treat the nest. Call for professional help to treat a yellowjacket nest. In some areas, the Mosquito and Vector Control District may be available to treat nests. To find out, call the California Mosquito and Vector Control Association at (916) 440-0826. If this service is not available, call a pest management professional (PMP).

ACTION PLAN FOR YELLOWJACKETS

WHEN TO TAKE ACTION	NONPESTICIDE PRACTICES	LAST RESORT
<ul style="list-style-type: none"> ▶ When you see five or more wasps hovering around garbage receptacles or food, or when you see one known colony within 30 feet of the children's play area or building. 	<ul style="list-style-type: none"> ▶ Make sure garbage receptacles have lids that properly seal. ▶ Keep food covered and indoors. ▶ Eliminate sugary drinks . ▶ Remove ripe fruit that drops from trees. ▶ Use yellowjacket traps. 	<ul style="list-style-type: none"> ▶ Find nearby yellowjacket nests. ▶ Hire a PMP to treat the nest directly with an appropriate residual insecticide and then remove the nest afterwards.

RESOURCES

University of California Statewide IPM Program: *Yellowjackets*
www.ipm.ucdavis.edu/PMG/PESTNOTES/pn7450.html

Department of Pesticide Regulation, *IPM in Child Care*
apps.cdpr.ca.gov/schoolipm/childcare

Our Water, Our World: Controlling Yellowjackets Around Your Home

ourwaterourworld.org.dnnmax.com/Portals/o/documents/pdf/Yellowjackets%2009.pdf

eXtension School Integrated Pest Management Action Plans
http://www.extension.org/pages/School_Integrated_Pest_Management:_Action_Plans

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SANITIZING SAFELY AND EFFECTIVELY

The California Community Care Licensing regulations state that child care teachers must be trained in housekeeping and sanitation, and that classrooms must be kept clean and sanitary. In addition, the national quality standards for health and safety in child care, *Caring For Our Children*, recommend that certain surfaces be sanitized or disinfected on a regular basis. This helps children and staff in child care centers stay healthy by reducing their exposure to the germs that cause disease, which are common in child care. Young children readily spread germs because they:

- ▶ sneeze, cough and drool.
- ▶ use diapers.
- ▶ are just learning to use the toilet.
- ▶ touch everything.
- ▶ put things in their mouths.

Infants, toddlers and preschoolers also:

- ▶ have immature immune systems.
- ▶ experience more illnesses than older children, especially when they spend time in child care.

What is the difference between cleaning, sanitizing and disinfecting?

Sometimes these terms are used interchangeably, but they are not the same. They have different outcomes and the United States Environmental Protection Agency (EPA) defines them this way:

- ▶ **To clean means to physically remove dirt, germs and debris from the surface by scrubbing, washing and rinsing. It is done using soap or detergent and water.**
- ▶ **To sanitize means to apply a product that kills 99.9% of germs identified on its label. Different disinfectant products kill different germs. You have to read the label to find out if the product kills all the germs that you want to kill.**
- ▶ **To disinfect means to apply a product that kills nearly 100% of germs identified on its label.**

What do you use to sanitize and disinfect?

Sanitizing and disinfecting are usually done using products, called antimicrobials, that kill bacteria, viruses, fungi and mold on hard surfaces. Because antimicrobials are intended to kill germs, they are pesticides. All products used to sanitize or disinfect must be registered by the EPA. Bleach is the most commonly used product for sanitizing and disinfecting in ECE.

Some non-chemical practices such as steaming can also be used to sanitize surfaces in certain situations. New methods, such as devices that convert tap water into ionized water, or high-quality microfiber cloths and mops used with soap and water can reduce germ counts like antimicrobials. More studies need to be done to be sure these alternative methods work as well as chemicals to sanitize in ECE environments.

How do you know which product to use to sanitize or disinfect?

The EPA tests each disinfection product to make sure that it kills germs and doesn't pose unreasonable immediate health hazards to those who are using it. If the product passes these tests, the EPA registers the product as a disinfectant. Only products with EPA registration numbers on the label can claim they kill germs. If a product is not registered with the EPA as a disinfectant, it should not be used to sanitize or disinfect. Proper cleaning (washing and rinsing with a soap or detergent) must be done before sanitizing. This step is needed since dirt can prevent disinfectants from working. In child care settings, sanitizing surfaces will kill enough germs to reduce the risk of becoming ill from touching those surfaces. Disinfecting (the higher level of germ killing) is recommended for blood spills to decrease the risk of spreading blood-borne illnesses such as HIV and Hepatitis B.

Why do so many child care programs use bleach to sanitize?

If used correctly, bleach reliably sanitizes and disinfects hard, non-porous surfaces of most common and harmful bacteria and viruses. Bleach has a short killing time and it does not need to be rinsed since it breaks down quickly. A low concentration is required and it is inexpensive.

[continued]

What are the problems with using bleach?

There are increasing concerns about the health effects of bleach, particularly for children with asthma. When bleach is applied to surfaces, it also gets into the air and can irritate the lungs and mucous membranes (the tissues that line and protect the inside of your body like the inside of your nose). For staff who mix bleach solutions, contact with full strength bleach can be harmful. It can damage skin, eyes and clothing.

Reduce the risk of harm from bleach by following these steps when preparing and using bleach:

TO SAFELY PREPARE BLEACH SOLUTION

- ▶ Dilute bleach with cool water and do not use more than the recommended amount of bleach.
- ▶ Make a fresh bleach solution daily; label the bottle with contents and the date mixed.
- ▶ Wear gloves and eye protection when diluting bleach.
- ▶ Use a funnel.
- ▶ Add bleach to the water rather than water to bleach to reduce fumes.
- ▶ Make sure the room is well ventilated.
- ▶ Never mix or store ammonia with bleach or products that contain bleach.

TO SAFELY USE BLEACH SOLUTIONS

- ▶ Apply the bleach solution after cleaning the surface with soap or detergent and rinsing with water.
- ▶ Allow for a two-minute contact time (use a timer) or air dry.
- ▶ Sanitize when children are not present.
- ▶ Ventilate the room and allow surfaces to completely dry before allowing children back.

- ▶ Store all chemicals in a secure area, out of reach of children.

RECOMMENDED BLEACH SOLUTIONS

- ▶ For food contact surface sanitizing (refrigerators, plastic cutting boards, dishes, glassware, counter tops, pots and pans, stainless utensils, toys that have been mouthed, high chair trays): **1 Tablespoon of bleach to a gallon of water. Let stand for 2 minutes or air dry.**
- ▶ For nonporous surface sanitizing and disinfecting (bathroom surfaces and fixtures, sinks, tile, glass, stainless steel, enamel, hard plastic, porcelain, doorknobs): **1/4 cup of bleach to one gallon of water or 1 tablespoon per quart. Let stand for 2 minutes or air dry.**

Are there alternatives to bleach?

The only program that currently certifies disinfectants that are safer for people and the environment is the EPA's Design for the Environment (DfE) Antimicrobial Pesticide Pilot Project (see Resources). Products with hydrogen peroxide as the active ingredient are being used by some child care programs as an alternative to bleach. Hydrogen peroxide breaks down to water and oxygen and does not leave harmful residues. New products containing stabilized hydrogen peroxide offer an alternative to more toxic cleaners, because they do not put irritating fumes into the air. Stabilized hydrogen peroxide is one of the active ingredients that have been approved by DfE's Antimicrobial Pesticide Pilot Project. Always check the product label for EPA registration and look for the DfE logo as well. Always follow the directions for sanitizing.

Do products such as baking soda, vinegar or borax sanitize?

While these products can be used to clean dirt from surfaces, they do not kill germs well enough to be sanitizers.

RESOURCES

Design for the Environment Antimicrobial Pesticide Pilot Project, www.epa.gov/pesticides/regulating/labels/design-dfe-pilot.html

EPA (2008) *What are antimicrobial pesticides?*
http://www.epa.gov/oppad001/ad_info.htm

California Community Care Licensing Regulations,
www.dss.cahwnet.gov/ord/PG587.htm

American Academy of Pediatrics, American Public Health Association, National Resource Center for Health and Safety in Child Care (2005) *Caring for Our Children*, second edition, AAP at: <http://nrckids.org/CFOC/index.html>

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GREEN CLEANING

What is “green cleaning”?

Green cleaning describes the growing trend of using cleaning products and methods that are safer for human health and the environment. By using products with less toxic ingredients, early care and education (ECE) programs can protect the health of children and staff and protect the environment. Environmentally friendly cleaning is accomplished by establishing policies and procedures and providing staff training in safe and effective cleaning practices.

Green cleaning improves indoor air quality and is often less expensive. The goal of green cleaning in ECE programs is to create environments that support healthy growth and learning for children and show a commitment to a healthy work environment for staff.

The key goals of green cleaning are to:

- ▶ keep the environment clean to protect children and staff from germs and triggers of illnesses such as asthma and allergies.
- ▶ protect children and staff from unnecessary exposure to chemicals in cleaning products that may cause harmful health effects.

To accomplish these goals, choose cleaning products and develop policies carefully and provide training for classroom, kitchen and custodial staff. In the past, the main priority for cleaning and sanitizing in ECE environments has been protecting children from the spread of infectious disease. But recent research suggests that the chemicals used to clean or kill germs may have harmful health effects. There are safer ways to protect children from the spread of infectious disease. For example, teaching children to wash their hands and making handwashing a routine practice in ECE is an effective policy for preventing the spread of germs that make children sick.

Regular cleaning is important

The everyday, routine cleaning activities of sweeping, wiping, vacuuming and scrubbing remove dirt, oils and moisture that germs need to thrive. When there is less buildup of dirt and germs, there is less need for strong chemicals to clean and sanitize.

- ▶ Regular cleaning keeps dust, pollen, pesticides and other particles out of the indoor environment and improves indoor air quality.
- ▶ Sanitizers are more effective at killing germs when the surface is clean.

Please note that green cleaning alone does not disinfect or sanitize surfaces. See CCHP’s Health and Safety Note, *Sanitizing Safely and Effectively in ECE* for more information on sanitizers and disinfectants.

STEPS TO KEEP YOUR CHILD CARE ENVIRONMENT CLEAN

- ▶ **Choose the right equipment and clean regularly** to reduce the need for chemicals to clean, sanitize and disinfect.
- ▶ **Use a vacuum cleaner with a high efficiency particulate air (HEPA) filter.** HEPA filtration vacuum cleaners trap mold spores, dust, dust mites, pet dander and other irritating allergens from surfaces.
- ▶ **Use microfiber mops and cloths.** Microfiber mops and cloths are made from a strong, lint-free synthetic fiber that is very absorbent. Dust, dirt and germs are attracted to and held tightly by the microfiber, so they are not spread from one area to another. Microfiber mop heads and cleaning cloths hold sufficient water for cleaning, yet don’t drip, and so less cleaning product is needed. Microfiber mops are also lighter and easier to use than conventional mops.
- ▶ **Place floor mats at building entryways.** Teach children to clean their feet when entering the building. This may capture 80% of soil entering indoor areas and reduces the amount of soil that must be cleaned.
- ▶ **Consider a policy that encourages people to remove their shoes when they come indoors.** Ask staff and families to provide a pair of “indoor” shoes or slippers.
- ▶ **Decrease clutter to make cleaning easier.** Store equipment and supplies in plastic boxes with tight-fitting lids.

[Steps to keep your child care environment clean continued]

- ▶ **Repair hard surfaces** that have cracks, pits or chips to reduce the buildup of dirt and germs.
- ▶ **Encourage frequent handwashing using gentle soap and running water.** Handwashing may play a larger role in preventing the spread of infectious illnesses than sanitizing and disinfecting.
- ▶ **Choose cleaning products that are less toxic.** This includes floor-care products used to maintain floor finishes since they are some of the most toxic products used in building maintenance.
- ▶ **Open windows and change filters in your heating, ventilation and air-conditioning systems to increase air circulation and improve indoor air quality.** Many illnesses are spread by breathing in germs that linger in the air, rather than by contact with germs on surfaces, so be sure to provide good ventilation in your program. Check with your building manager to make sure the heating and ventilations systems are maintained.

Choosing cleaning products that are safer for people and the environment

Many cleaning products contain toxic chemicals. Children are easily exposed to the chemicals in cleaning products because they:

- ▶ breathe in the chemicals that get into the air when these products are used;
- ▶ absorb chemicals through their skin when they touch surfaces that have chemical residues;
- ▶ mouth objects (for example, toys) and surfaces and swallow chemicals that are on those objects and surfaces.

Many consumers mistakenly believe that if the word “green” appears in the name of a cleaning product, then the product is safe. This is not necessarily true. The easiest, and most reliable, way to choose safer cleaning products is to choose products that have been certified by third-party programs such as the Green Seal™ and EcoLogo™ certification programs. See *Resources* for contact information. These groups identify cleaning products that:

- ▶ contain the safest possible ingredients.
- ▶ perform well.
- ▶ are cost-effective.
- ▶ avoid added fragrances that can cause respiratory irritation and trigger asthma.

The certified cleaning product categories include general purpose cleaners, glass cleaners, bathroom cleaners, carpet cleaners and floor cleaners. Choosing certified products that meet green standards is a good way to reduce toxins and make an immediate positive impact on the health of the ECE environment. To quickly identify these certified products, check the label for Green Seal or Ecologo certification. Avoid products that say POISON, DANGER, CAUTION or WARNING.

Safer disinfectants

The only program that certifies disinfectants that are safer for people and the environment is the EPA’s DfE Antimicrobial Pesticide Pilot Project. If you see the DfE logo on an EPA-authorized disinfectant, you will know the product is:

- ▶ in the least hazardous EPA Toxicity Categories;
- ▶ unlikely to have carcinogenic or endocrine disruptor properties;
- ▶ unlikely to cause developmental, reproductive, or neurotoxic harm.



RESOURCES

A full listing of products certified as cleaners (both household and institutional) can be found online:

www.greenseal.org/findaproduct/cleaners.cfm

Ecologo

www.ecologo.org/en/greenproducts/

Design for the Environment

<http://www.epa.gov/dfe/>

California Childcare Health Program (2005)

Recommendations for Cleaning, Sanitizing and Disinfecting
www.ucsfchildcarehealth.org/pdfs/healthandsafety/recommenEN_adr.pdf

Rose, L, Westinghouse, C, and the National Cleaning for Healthy Schools and Infection Control Workgroup (2010)
Cleaning for healthy schools and infection control handbook
www.informedgreensolutions.org

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