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.**

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ACTION PLAN FOR ANTS

WHEN TO TAKE ACTION	NONPESTICIDE PRACTICES	LEAST HARMFUL PESTICIDE	LAST RESORT
▶ If you see a few ants inside, there are likely to be more soon.	▶ 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.	▶ Rely on baits, a non-spray pesticide, to manage the ants.	▶ 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/0/documents/pdf/Ants%2009.pdf

County Agricultural Commissioner List (if you think you have red imported fire ants)
www.cdfa.ca.gov/exec/county/county_contacts.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.**

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[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
▶ When you discover nits or head lice on hair shafts.	▶ 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.	▶ Educate parents about detecting and managing head lice.	▶ 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*
www.ucsfchildcarehealth.org/pdfs/illnesses/Head%20Lice_0509.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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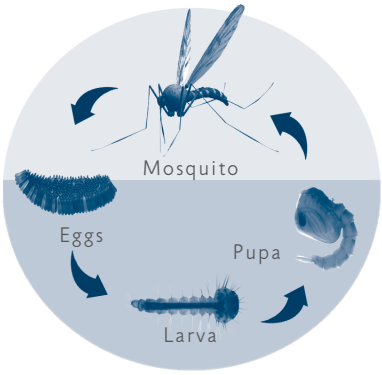
INTEGRATED PEST MANAGEMENT: MOSQUITOES

Mosquitoes are small flying insects that have been around for millions of years. Female mosquitoes bite because they need blood to nourish their eggs. While their bites are annoying to humans, mosquitoes provide food for fish, birds and bats, and they even pollinate flowers.

When are mosquitoes a problem?

Mosquito bites can cause allergic reactions, pain, irritation, redness and itching. Children who scratch their bites a lot, especially with dirty fingers, may also develop secondary bacterial infections. In some areas, mosquitoes spread serious diseases such as West Nile virus and Western equine encephalomyelitis virus. These diseases are rare but can be serious in children, people with weakened immune systems and the elderly, and can lead to death.

Characteristics and habits



Life cycle of a mosquito

Mosquitoes go through several stages. Female mosquitoes lay their eggs in still or standing water in surface pools, tree holes and even old tires (like those used in a tire swing). The mosquito larvae, or wigglers, swim in this water and soon develop into pupae. When the pupae develop into winged adults, they leave the water and become flying land insects. Adult mosquitoes normally live less than a week or two.

How do mosquitoes find you?

Female mosquitoes bite people, pets and livestock. The males don't bite at all. Female mosquitoes can detect chemicals in your sweat and heat from your body. They also notice when you move, especially when you wear clothing that's a different color from your surroundings. Most mosquitoes come out at dusk.

IPM strategies

It's impossible to eliminate mosquitoes. The goal is to reduce mosquitoes to a tolerable level for humans. Sprays do not necessarily keep mosquitoes away and they expose everyone to pesticides and solvents.

1 KEEP MOSQUITOES OUT

- **Make sure windows and doors are covered by mesh screens that don't have holes.**
- **Avoid places with lots of mosquitoes.**
- **Avoid being outdoors at dusk.**
- **Wear protective clothing outdoors.**

2 REMOVE MOSQUITOES' WATER AND SHELTER

Any object that can hold water for more than a few days should be drained, discarded, filled with soil or cement, treated with *Bacillus thuringiensis israelensis* (a safe microbial insecticide usually called Bti) or stocked with mosquito fish.

- **Eliminate standing water that mosquitoes breed in.**
  - Check small containers like cinder blocks, flower pot saucers, old tires or crotches of trees for water present more than a few days.
  - Remove toys that collect water.
  - Change water in pet dishes, watering troughs and bird baths at least weekly.
  - Avoid overwatering lawns and gardens, which lead to standing water.
  - Keep litter and garden debris out of street gutters.
  - Fill open tree holes with sand or mortar.

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[IPM strategies continued]

- **Cut down tall grass and weeds in outside areas where mosquitoes rest during the day when it's hot and dry.**
- **Don't use electric bug zappers because they kill beneficial and neutral insects, but very few mosquitoes.**

3 KEEP MOSQUITOES AWAY

- **Use insect repellents if mosquitoes are really bothersome and you have to be outdoors. Some effective repellents are:**
  - **Picaridin** is as effective as DEET, but with fewer health risks. Unlike DEET, Picaridin is odorless, does not feel greasy or sticky and is less likely to irritate the skin.
  - **Products containing DEET** (N,N-diethyl-metatoluamide) are also effective, but may be more toxic at high doses. Some people dislike the odor and that it irritates the skin. DEET confuses the chemical receptors of mosquitoes, making it harder for the mosquito to find you. Special formulations for children contain low concentrations of DEET in an oil-based medium that slowly releases the compound and limits the absorption.
  - **Other effective repellents** include the biopesticides **oil of lemon, eucalyptus** and **IR3535,** which are derived from natural materials.
- **Repellents are effective for only 4 hours or less depending on wind, temperature, humidity and sweating.**

ACTION PLAN FOR MOSQUITOES

WHEN TO TAKE ACTION	NONPESTICIDE PRACTICES	LEAST HARMFUL PESTICIDE	LAST RESORT
▶ When mosquitoes become bothersome.	▶ Keep window screens in good repair. ▶ Wear long pants and sleeves. ▶ Eliminate standing water. ▶ Use a flyswatter or newspaper to individually kill mosquitoes. ▶ Report problem to your mosquito abatement district. Call the California Mosquito and Vector Control Association at (916) 440-0826.	▶ Use safe insect repellents (see above). ▶ Treat water with mosquito fish or environmentally friendly bacteria such as Bti, that target just mosquitoes. ▶ Mosquito fish are most effectively used in small, man-made bodies of water, such as ponds that cannot be drained and don't connect with natural waters. Never put fish in a natural pond, lake, creek or river.	▶ Contact a pest management professional (PMP) for pesticide application. ▶ Outdoor insecticide sprays can temporarily reduce the number of adult mosquitoes, but they don't last long. Some also have harmful health effects.

RESOURCES

University of California Statewide IPM Program: *Mosquitoes*
www.ipm.ucdavis.edu/PMG/PESTNOTES/pn7451.html

Mosquito and Vector Control Association of California
mvcac.org

EPA: *Active Ingredients Found in Insect Repellents*
www.epa.gov/pesticides/health/mosquitoes/ai_insectrp.htm

EPA: *How to Use Insect Repellents Safely*
www.epa.gov/pesticides/health/mosquitoes/insectrp.htm

Center for Disease Control: *Updated Information Regarding Mosquito Repellents*
www.cdc.gov/ncidod/dvbid/westnile/resources/uprepinfo.pdf

EPA: *Insect Repellent: Use and Effectiveness*
cfpub.epa.gov/oppref/insect/index.cfm

eXtension School Integrated Pest Management Action Plans
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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.

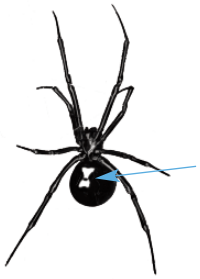
When are spiders a problem?

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.

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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.

❶ 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.**

❷ 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.**

❸ 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
▶ When you see spiders in your center.	▶ 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.	▶ 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.

RESOURCES

University of California Statewide IPM Program: *Spiders*
www.ipm.ucdavis.edu/PMG/PESTNOTES/pn7442.html

Our Water, Our World: *Living with Spiders, The Helpful Hunters*
www.ourwaterourworld.org/Portals/o/documents/pdf/Spiders%2009.pdf

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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.**

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[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
▶ When you see one cockroach! ▶ If you see one cockroach there are likely more.	▶ 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.	▶ Cockroach bait stations or gel applied to cracks and areas out of children's reach.	▶ 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/pestmgt/pubs/roach_color.pdf

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INTEGRATED PEST MANAGEMENT: **RODENTS**

The most common rodent pests are the roof rat, the Norway rat and the house mouse. Mice are more common and more difficult to manage than rats. To protect the health of children and staff in early care and education (ECE) facilities, we need strong integrated pest management (IPM) programs to manage rats and mice.

When are rodents 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, saliva and dander of rats and mice may also trigger asthma attacks. 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.

Characteristics and habits

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 their food and water, and a place to live are still available, it's likely that other rodents will soon appear.

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1 KEEP RODENTS 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 and copper wool 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 RODENTS' FOOD

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

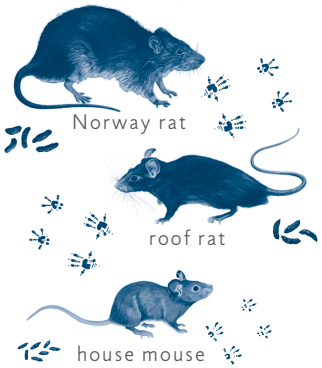
- **Discard food waste in indoor and outdoor eating areas in domed-lid trash containers lined with plastic bags.**
- **Clean garbage cans and dumpsters frequently to prevent the build-up of food waste.**
- **Keep dumpsters on hard concrete surfaces away from the building.**

3 MONITOR

Look for:

- **rodent droppings.**
- **burrows in the ground.**
- **nests in ivy or around cluttered areas.**
- **fruit or nuts that have been gnawed on.**

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.

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 RODENTS

- **Traps:** Use snap traps baited with food (peanut butter is a good bait).
  - **Always wear gloves when handling traps to protect yourself from diseases.**
  - **Place traps near openings rodents use to enter buildings and between walls and equipment, with the baited end perpendicular to walls so rodents will be caught coming from either direction.**
  - **Set traps behind objects, in dark corners, and in places where there's evidence of rodent activity. Make sure traps are placed out of children's reach.**
  - **To improve success with catching rats, put out traps with bait such as peanut butter, but do not set the traps for several days until the rats are used to them.**
  - **Use enough traps to make the trapping period short and productive in managing your rodent problem. Empty and reset traps daily until no more rodents are caught; then check them weekly.**
  - **Mice seldom venture far from their shelter and food supply, so space mouse traps no more than 10 feet apart in areas where mice are active.**
- **Baits:** If the rodent infestation is severe, baiting may be necessary, and should be done by a pest management professional (PMP) who knows how to use these poisons safely.
  - **Baits must be placed out of children's and pets' reach and in tamper-resistant bait stations.**
  - **Rodenticide baits shouldn't be used indoors because a rodent could die inside the walls or ceilings. Carcasses attract flies, which then may infest the entire building if the carcass isn't removed quickly.**

6 CLEAN UP AFTER RODENTS

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 spray the urine and droppings with a mixture of 1 part bleach to 10 parts water. Let soak 5 minutes. Use a paper towel to pick up the urine and droppings and dispose of them in the garbage. Mop floors with a bleach solution. Remove and dispose of gloves and wash hands.

ACTION PLAN FOR RODENTS

WHEN TO TAKE ACTION	NONPESTICIDE PRACTICES	LAST RESORT
▶ If you see one rodent.	▶ Clean up cluttered areas. ▶ Sanitize and keep things clean. ▶ Seal all cracks and openings that are bigger than ¼ inch. ▶ Identify rodent pathways by looking for rub marks or trails of urine. ▶ Use traps and make sure they are out of children's reach.	▶ Contact a PMP to help with rodenticides. Rodenticides can be used outdoors, but should be placed in a tamper-resistant bait station and secured to a concrete block. ▶ Make sure to check the bait stations and replace baits at least once a month to ensure freshness of the bait.

RESOURCES

DPR Pest Info, IPM for Schools—*Preventing Mice and Rats from Invading Your School*
www.cdpr.ca.gov/docs/pestmgt/pubs/rats_color.pdf

University of California Statewide IPM Program, Pest Notes: *Rats*
www.ipm.ucdavis.edu/PMG/PESTNOTES/pn74106.html

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

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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.**

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[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
▶ 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.	▶ 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.	▶ 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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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.

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[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
▶ When you see snails or slugs, their slime trails, or leaves with a lot of irregular holes.	▶ 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	▶ Use iron phosphate baits.	▶ 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

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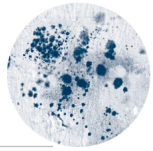
INTEGRATED PEST MANAGEMENT: **MOLD**



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.

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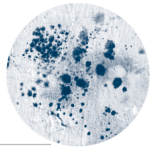

[IPM strategies continued]

- 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
▶ When you see or smell mold or mildew growing.	▶ Inspect thoroughly to identify where the mold problem is present.	▶ Scrub the mold off with detergent and water and completely dry the area. ▶ If the mold problem is too big, hire a professional.	▶ 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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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.**

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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.

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[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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