

Pest Prevention by Design in Schools



Center of Expertise for School IPM



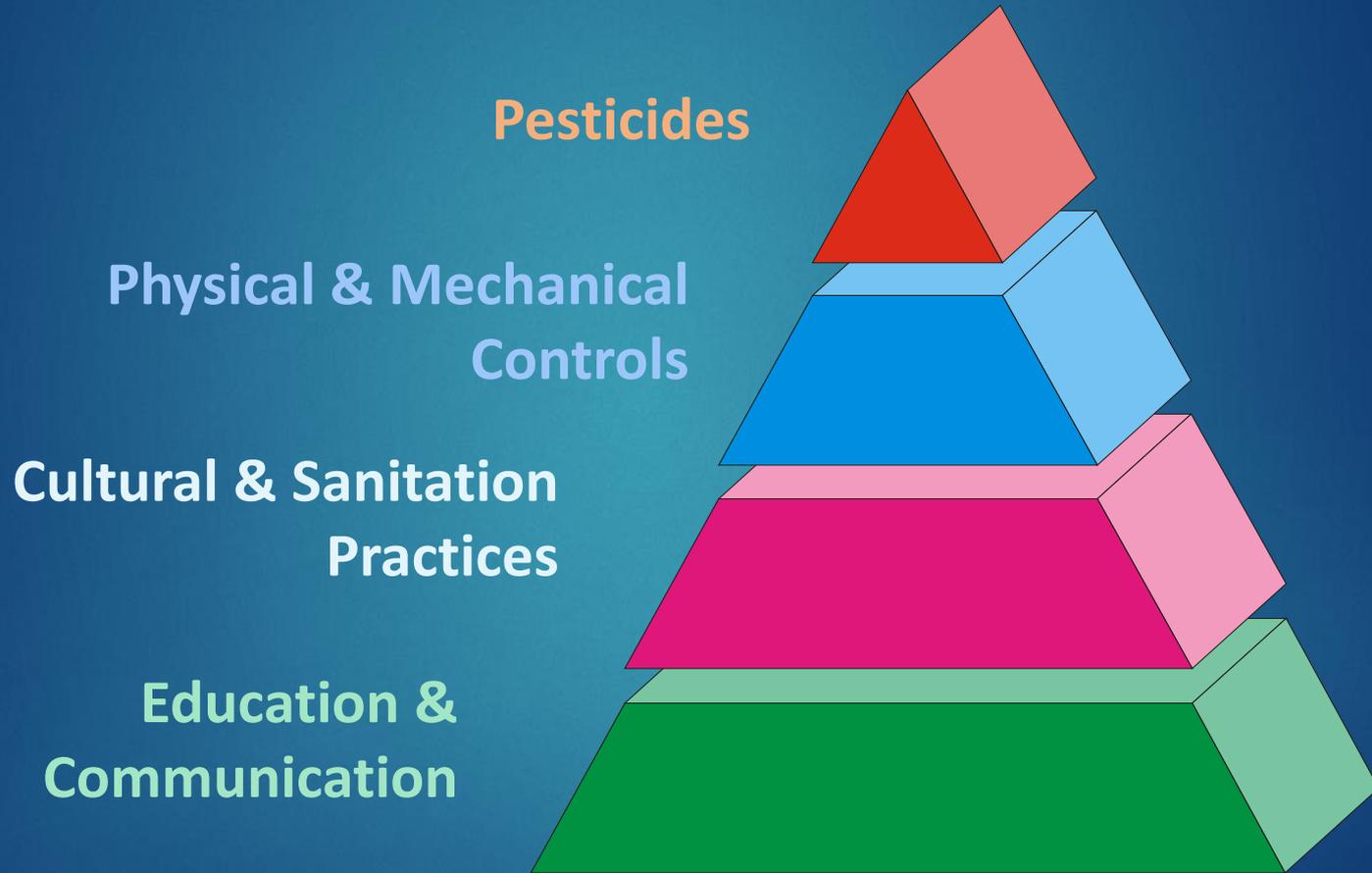
Protecting Children in Schools from the Health Risks associated with Pests and Pesticides





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IPM Basics



Benefits of School IPM

- ▶ **Smart:** addresses the root cause of pest problems
- ▶ **Sensible:** provides a healthier learning environment
- ▶ **Sustainable:** better long-term control of pests



Presenters

Chris Geiger, PhD



Robert 'Bobby' Corrigan, PhD.



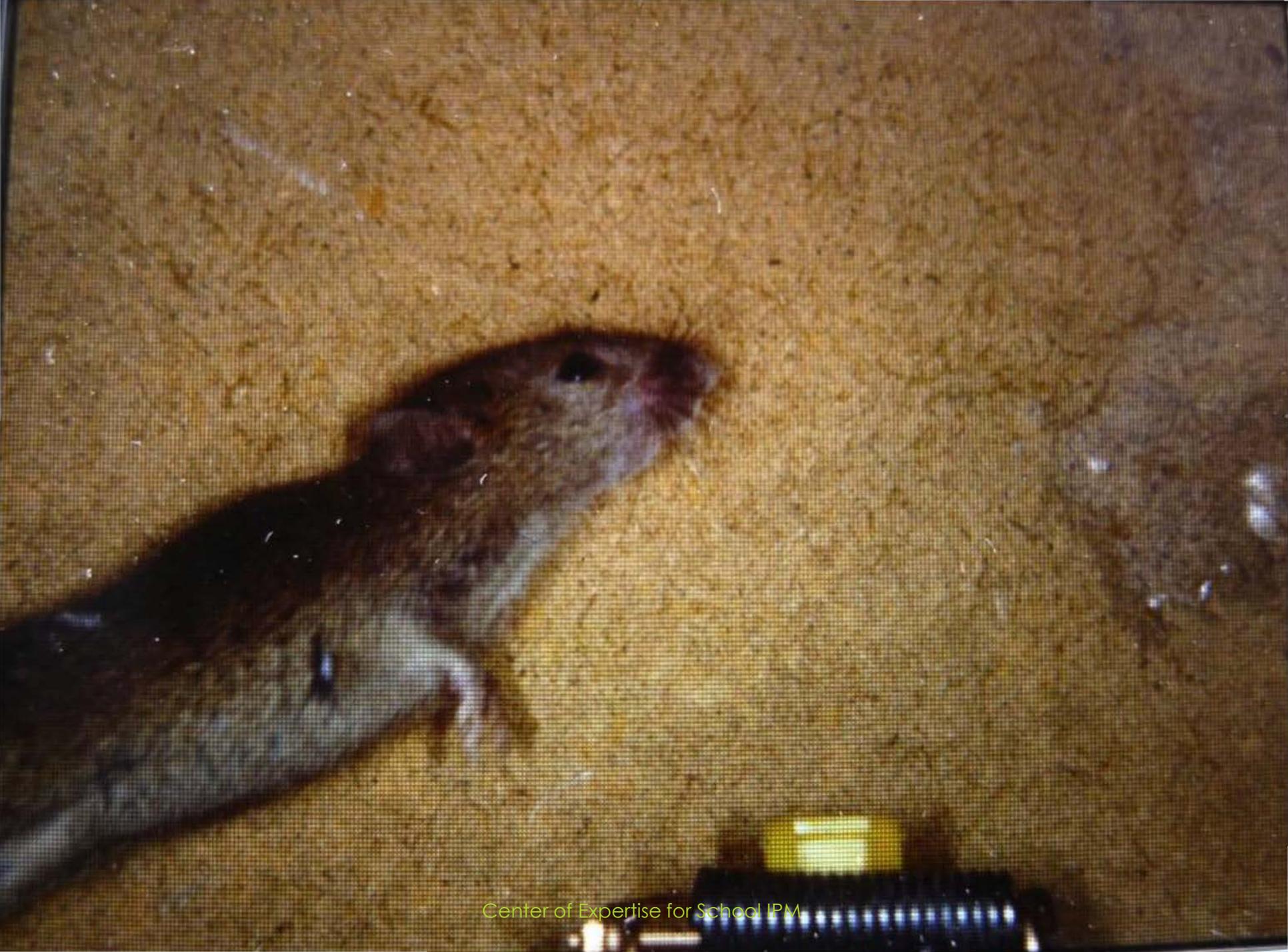
Pest Prevention By Design For Schools Part I

School IPM Center of Expertise

Mice

Cockroaches





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preventative

reactive

Ectoparasites (mites, fleas, lice, etc.)
Feces, urine (allergens, pathogens)
Pest body parts (allergens)



Mouse Allergens in Urban Elementary Schools and Homes of Children with Asthma

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Mouse and cockroach allergens in the dust and air in northeastern United States inner-city public high schools

Abstract Considering that high school students spend a large proportion of their waking hours in the school environment, this could be an important location for exposure to indoor allergens. We have investigated the levels of mouse and cockroach allergens in the settled dust and air from 11 schools in a major northeastern US city. Settled dust samples were vacuumed from 87 classrooms, three times throughout the school year. Two separate air samples (flow = 2.5 lpm) were collected by 53 students over a 5-day period from both their school and their home. Mouse allergen (MUP) in the dust varied greatly between schools with geometric means ranging from 0.21 to 133 $\mu\text{g/g}$. Mouse allergen was detectable in 81% of the samples collected. Cockroach allergen (Bla g 2) ranged from below limit of detection ($<0.003 \mu\text{g/g}$) to 1.1 $\mu\text{g/g}$. Cockroach allergen was detected ($>0.003 \mu\text{g/g}$) in 71% of the dust samples. Bla g 2 was detected in 22% of airborne samples.

Mouse allergen was only detected in 5%. These results indicate that the school may be an important location for exposure to allergens from mice and cockroaches and is an indoor environment that should be considered in an overall allergen intervention strategy.

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Key words: School; Mouse; Cockroach; Allergen;
Airborne; Dust.

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Roden
Academy
Parking

Entrance











definitely

clean

*Cockroaches, ants, mice, rats, flies,
pigeons, yellowjackets, cats, dogs,
raccoons,*



GARBAGE ONLY

CAUTION
DO NOT OPERATE
THIS EQUIPMENT
UNLESS YOU ARE
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AND CERTIFIED
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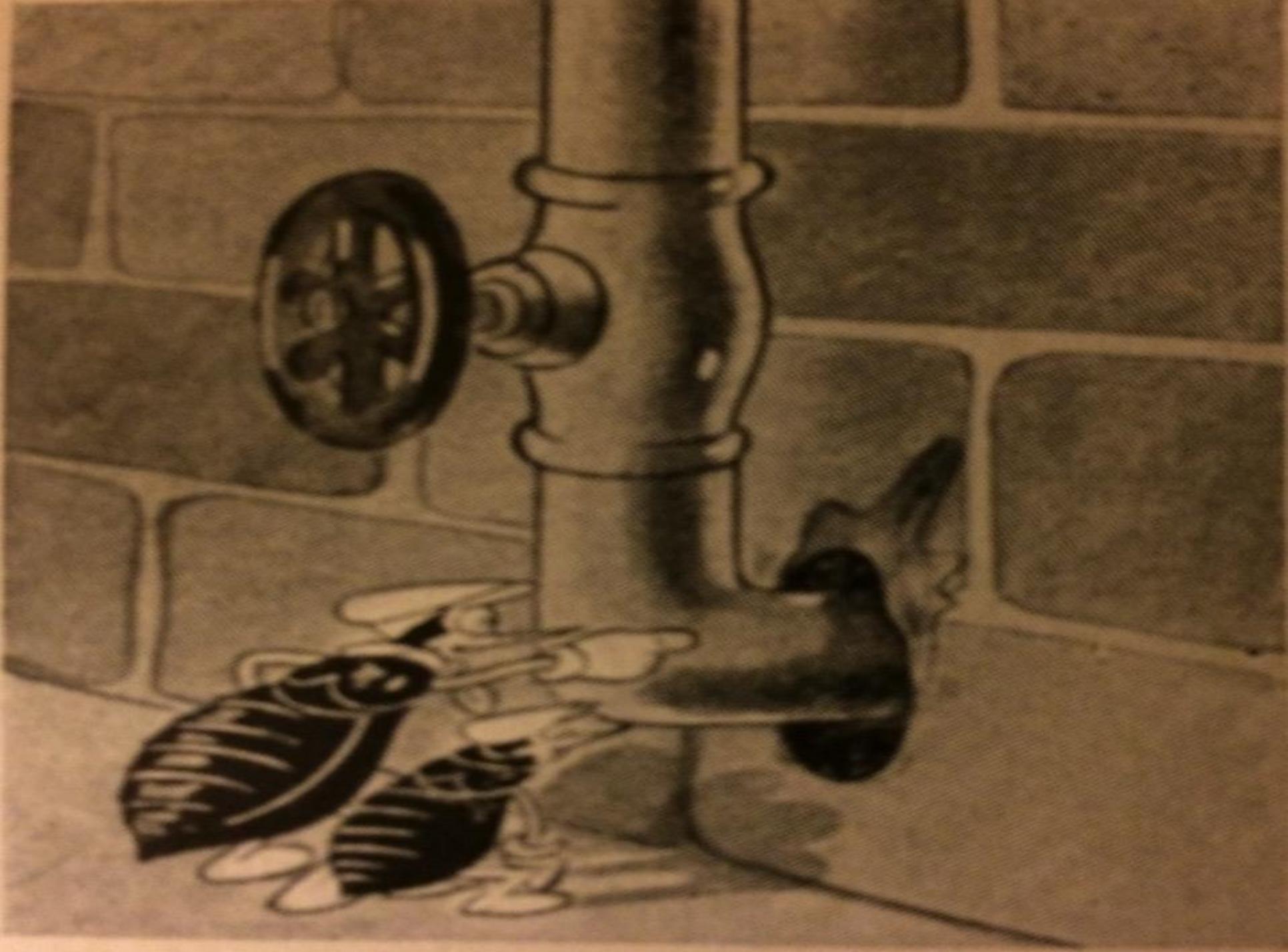
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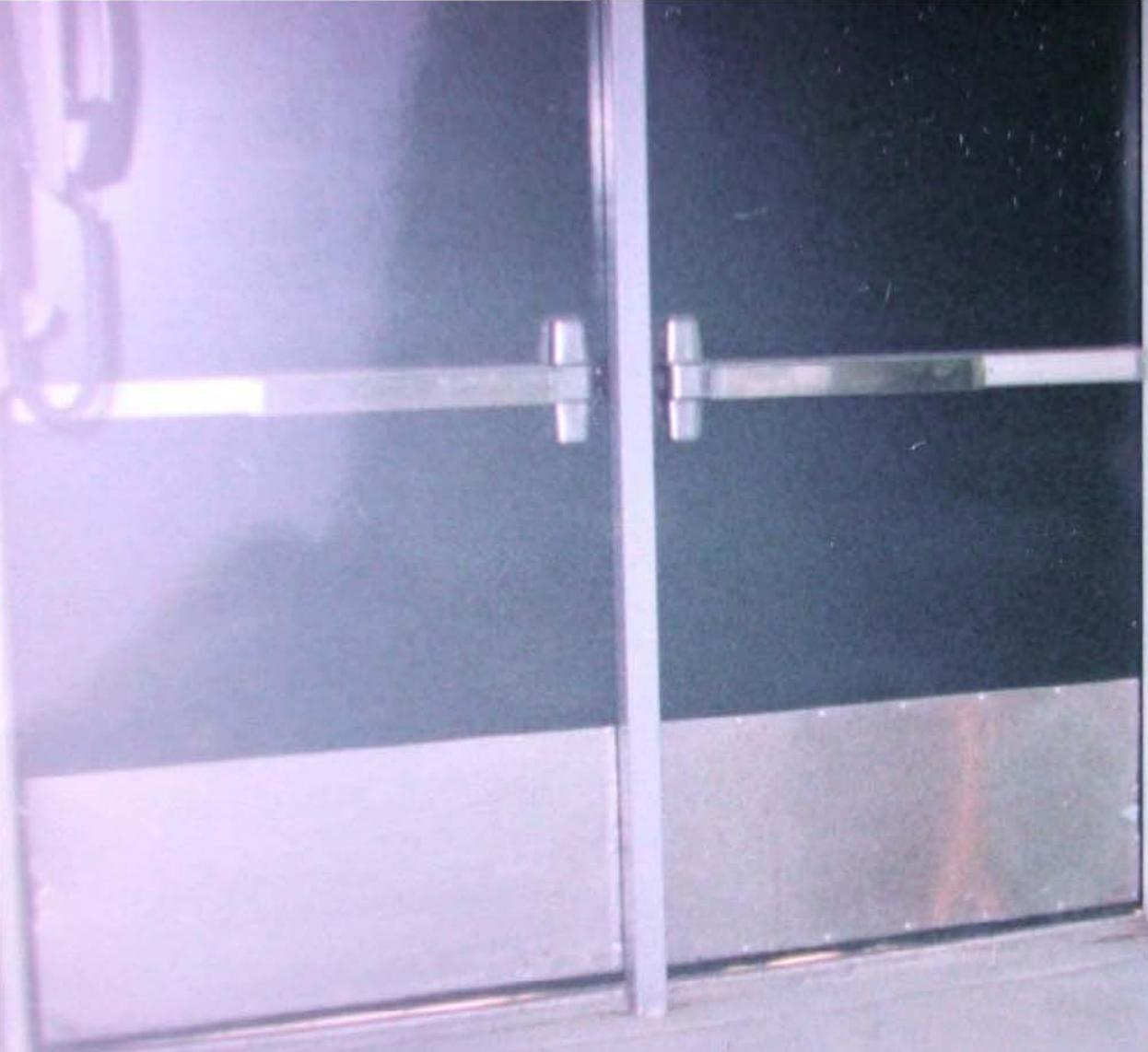








B. Non-door Areas



CAUTION
IN CASE OF APPLICANT FIRE,
PULL THE ALARM AND
EXIT THE BUILDING IMMEDIATELY.



and 3/4in/19mm in width. (Figure 9-2) Note:

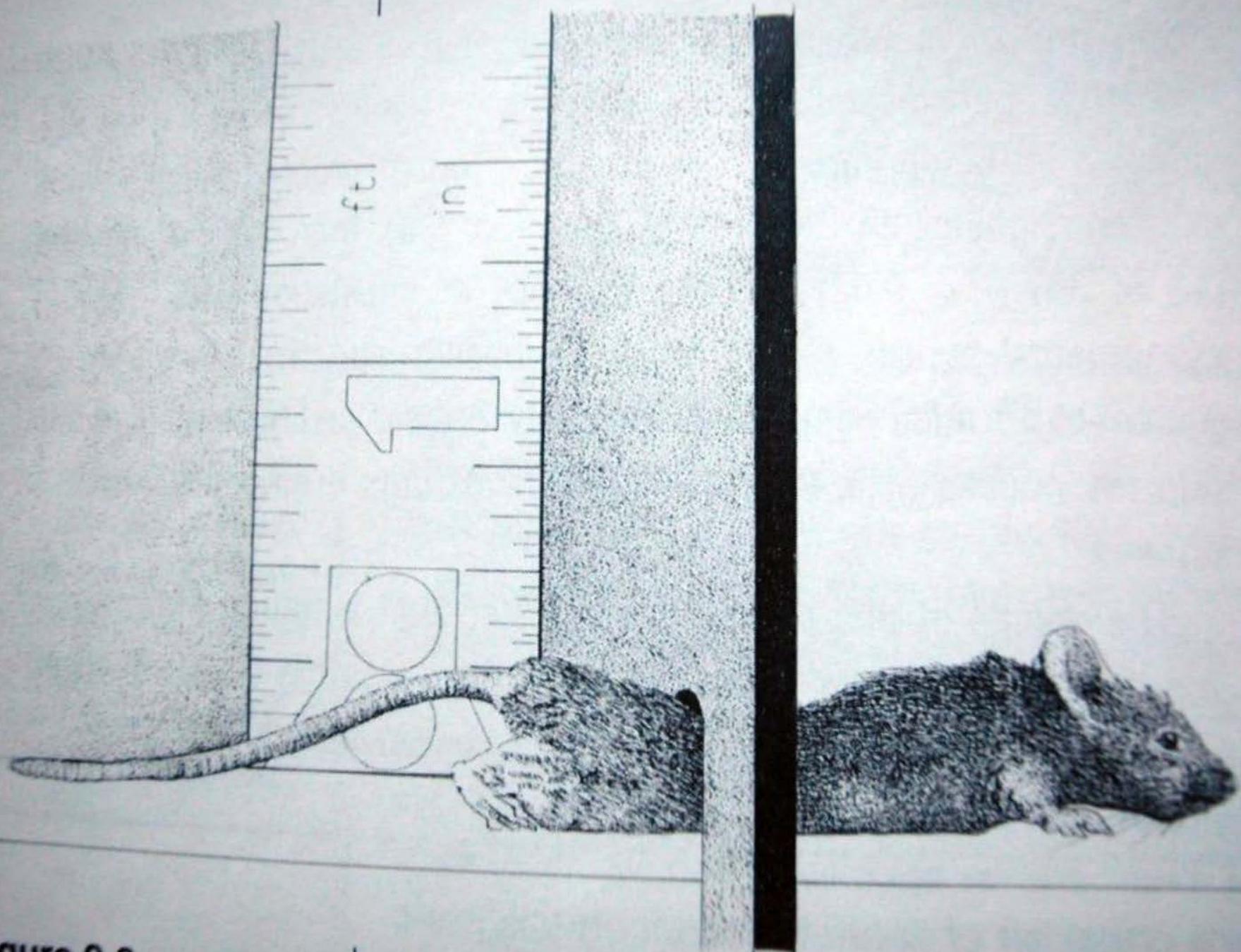


Figure 9-2

* Muzzles that
come to a point

* Flexible tube-
shaped bodies















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Access





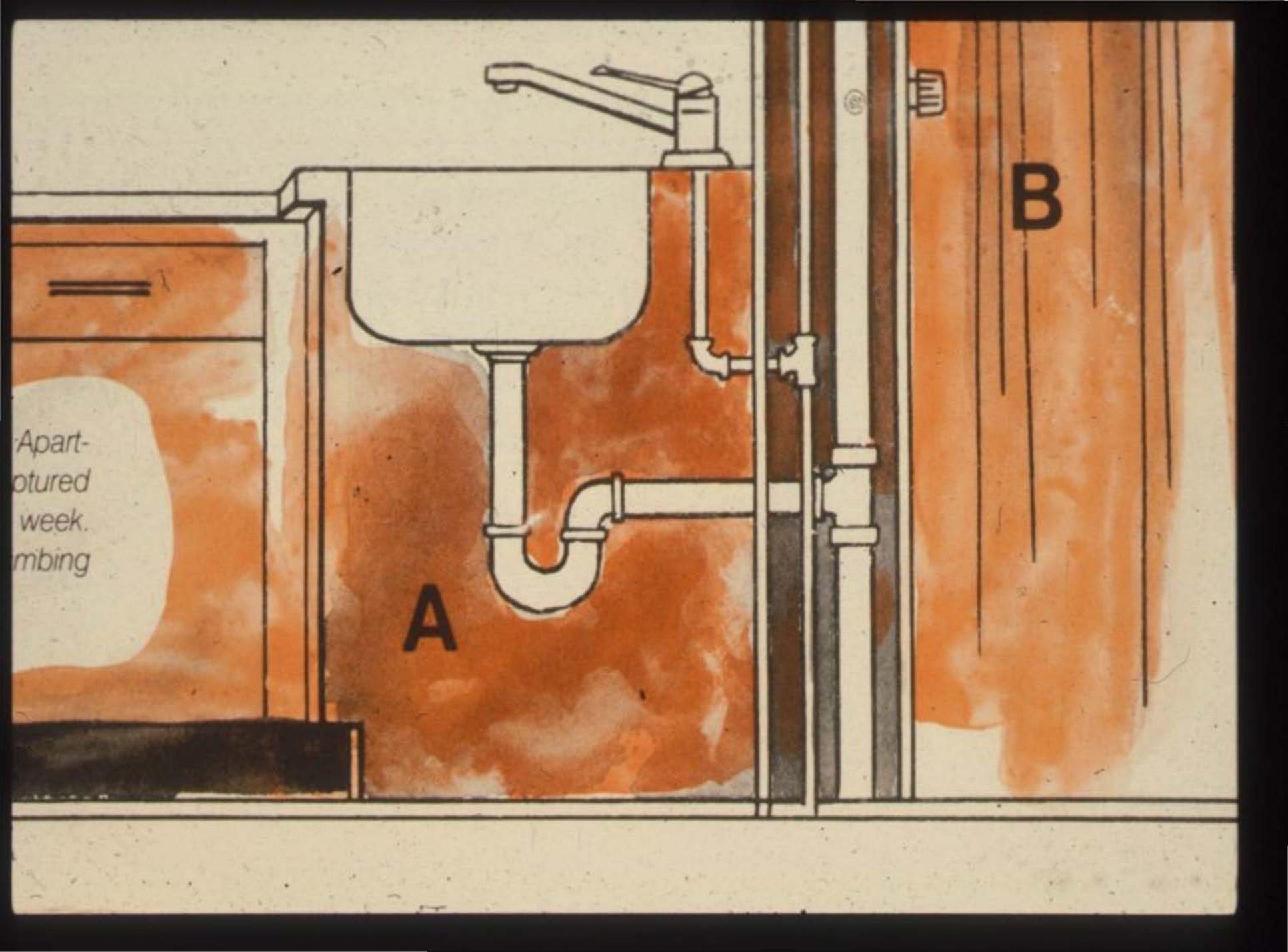




Apart-
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week.
mbing

A

B







pest caves









Photo: Discover.wildlife



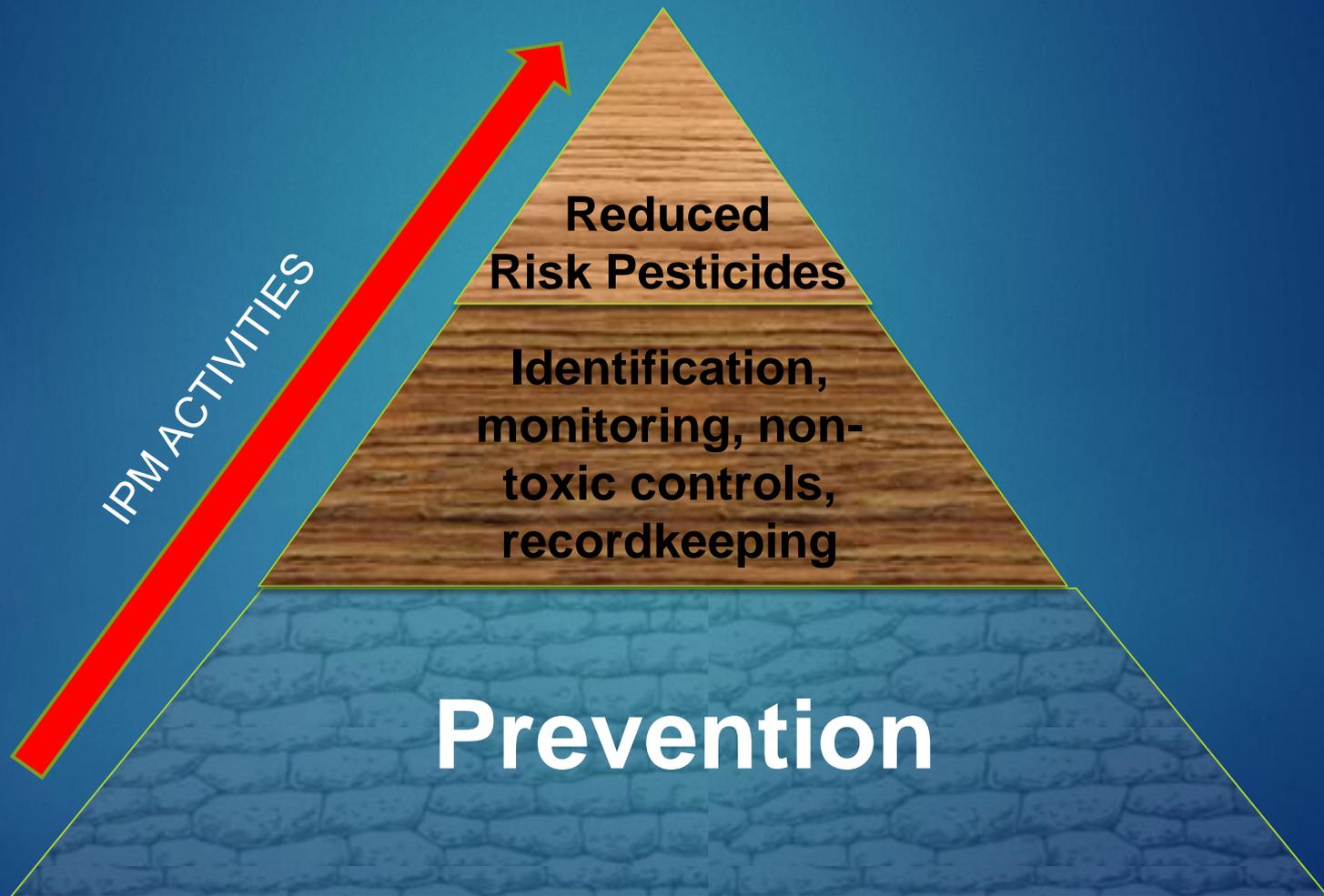
How to Get an A+ in Preventing Pests

EPA School IPM Webinar: Pest Prevention by Design

Chris Geiger, Ph.D.
Toxics Reduction & Ecosystem Health Program
San Francisco Department of the Environment

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Integrated Pest Management



Step One: Prevention

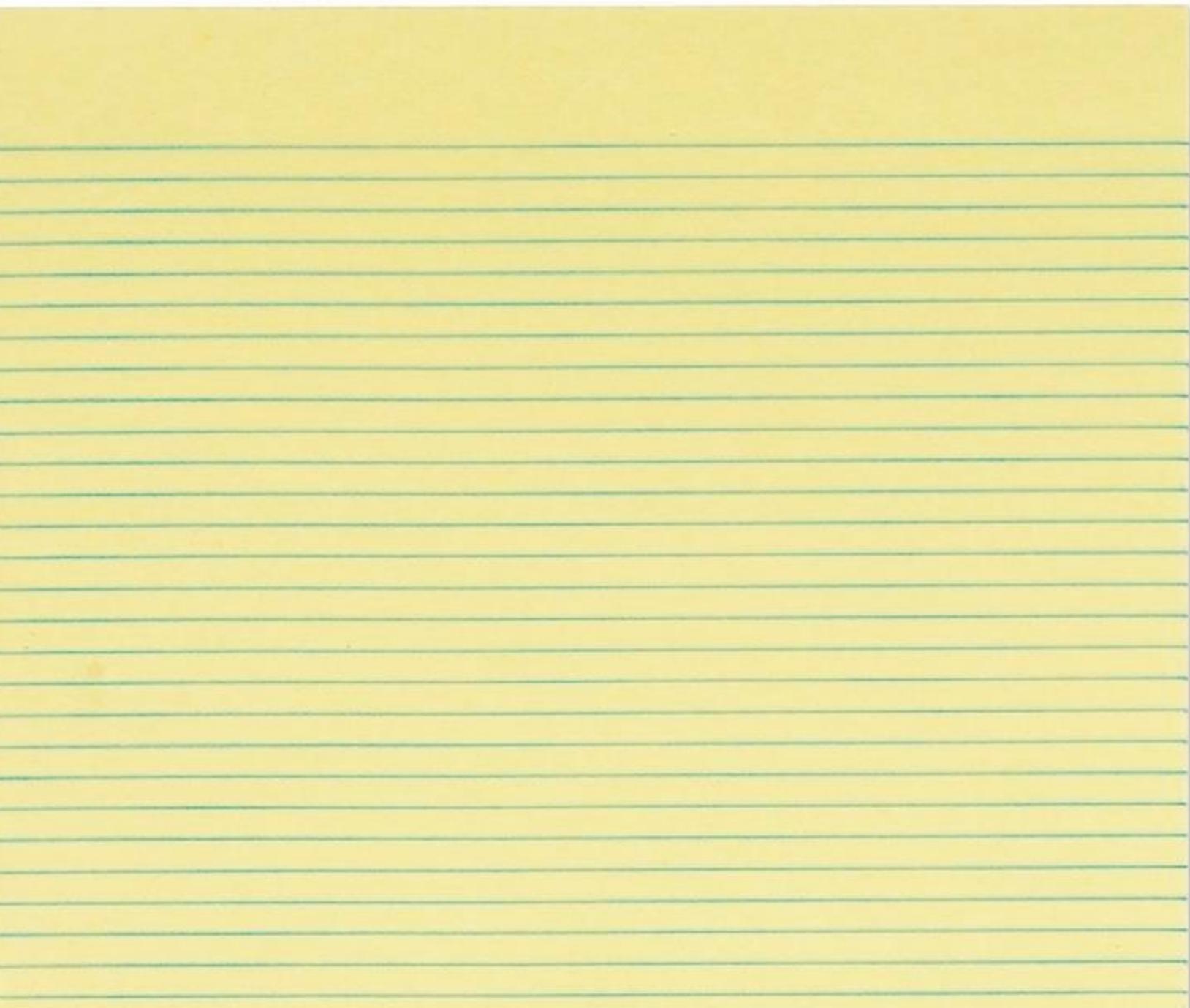
Food

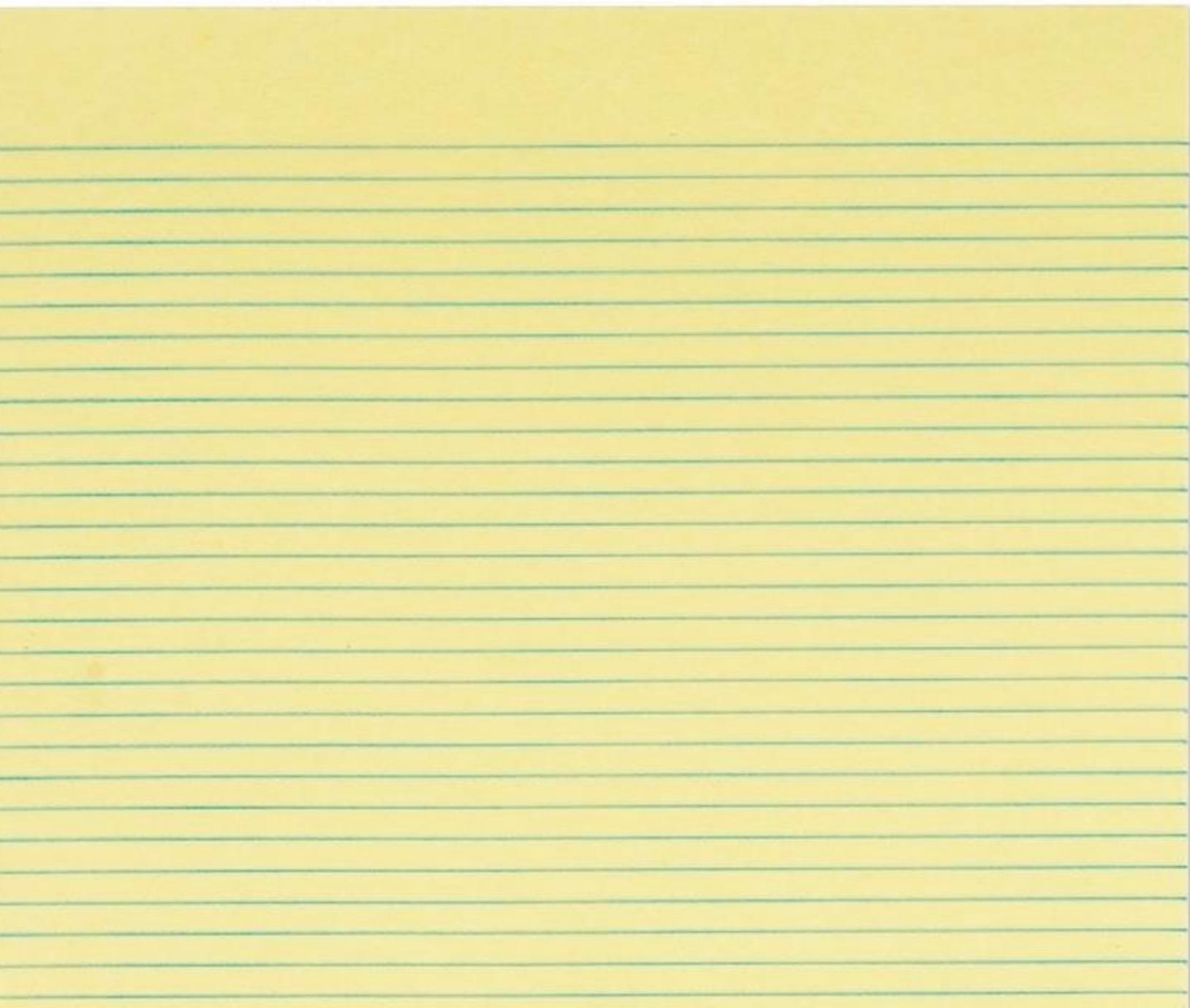
Water

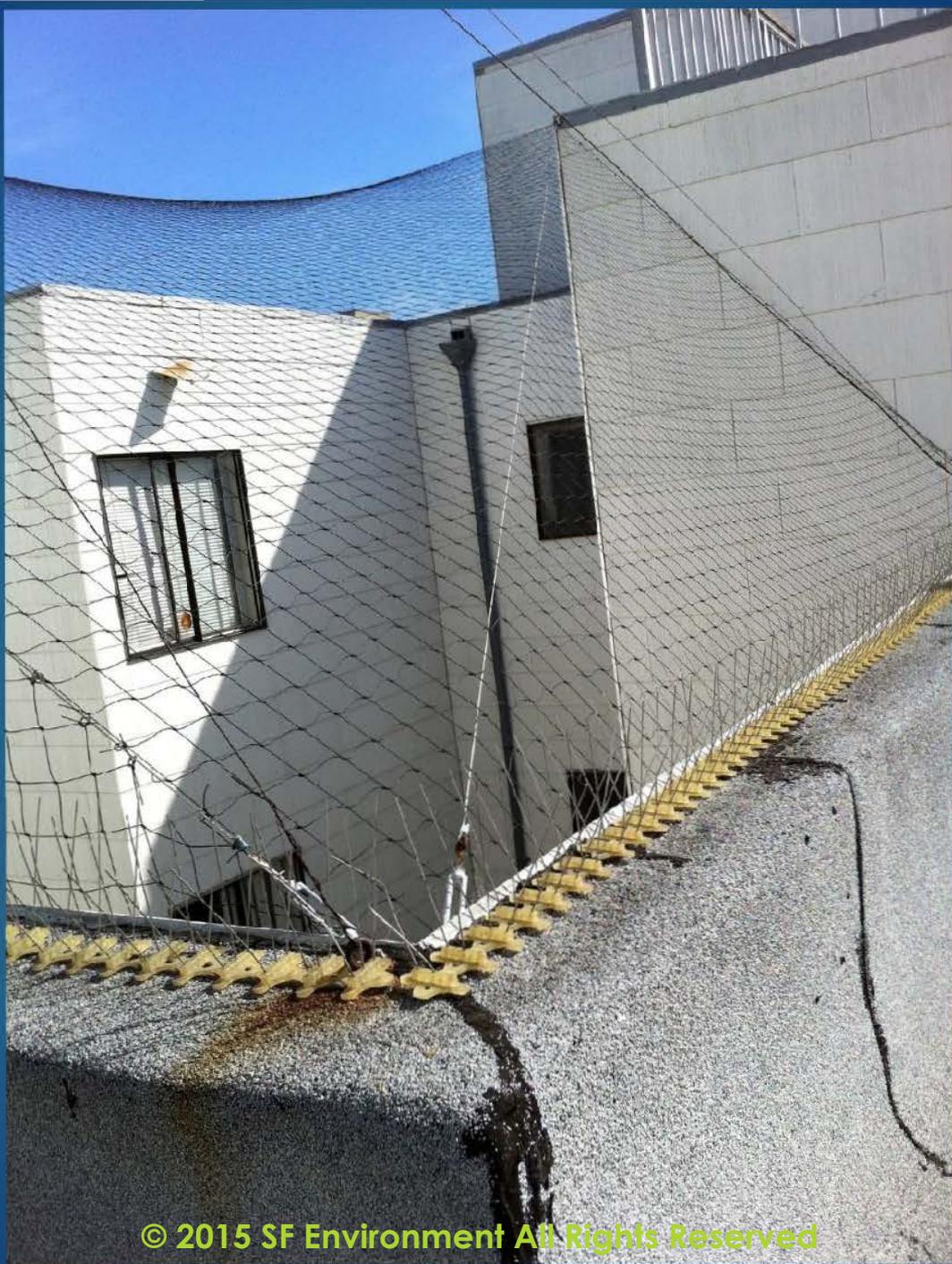
Harborage

Entry









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(2
inches)







($\frac{1}{2}$ inch)





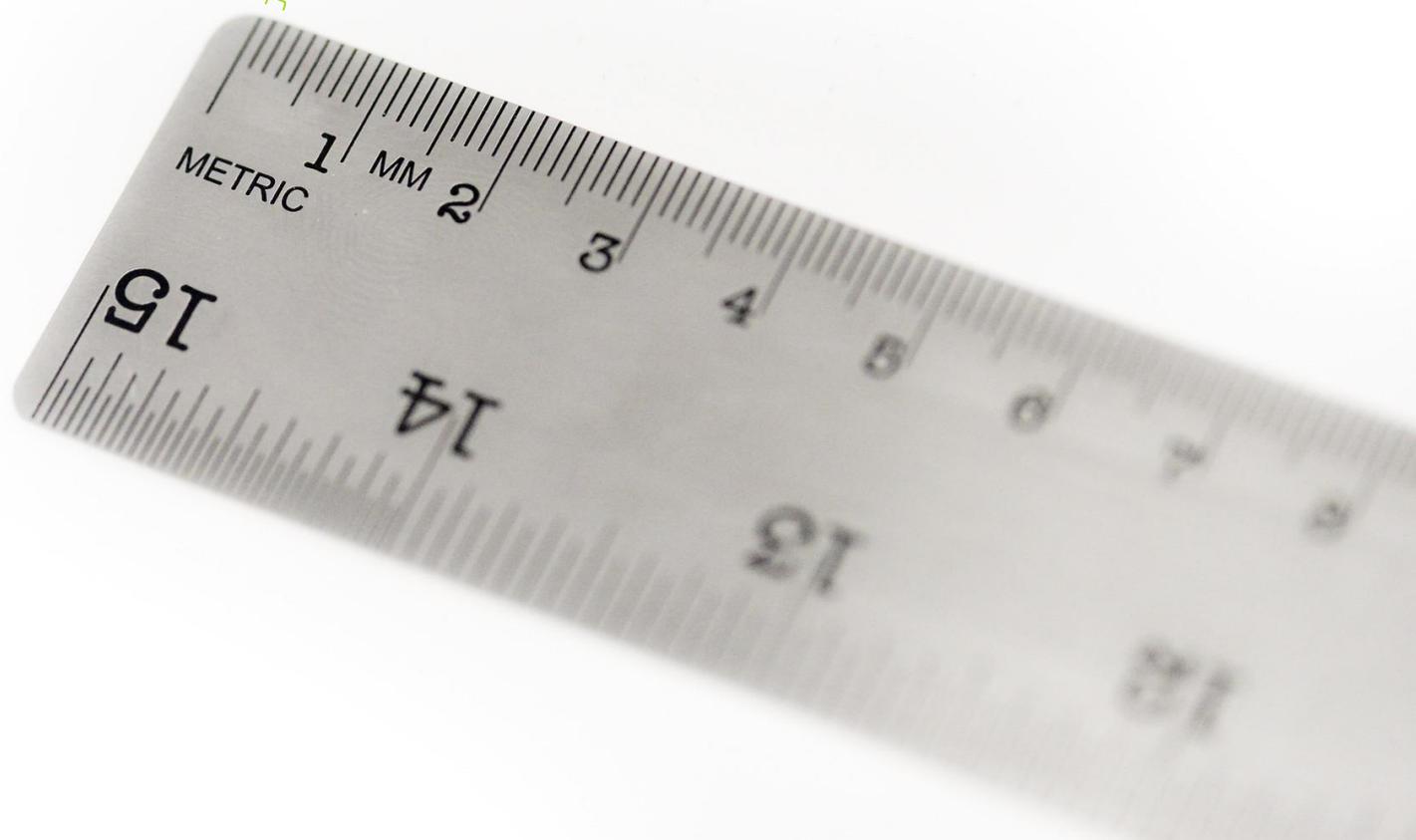


($\frac{1}{4}$ inch)



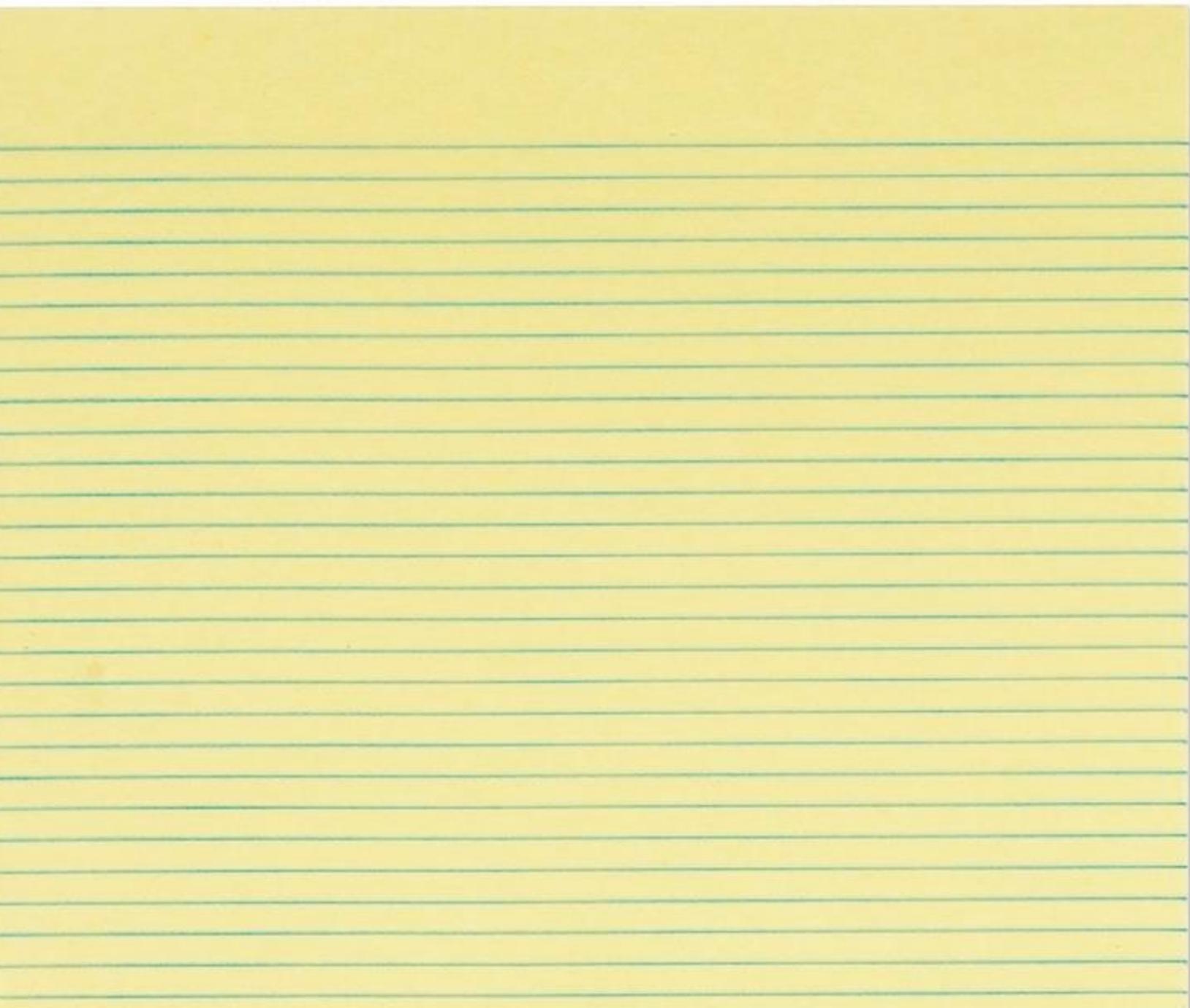


1.66 mm



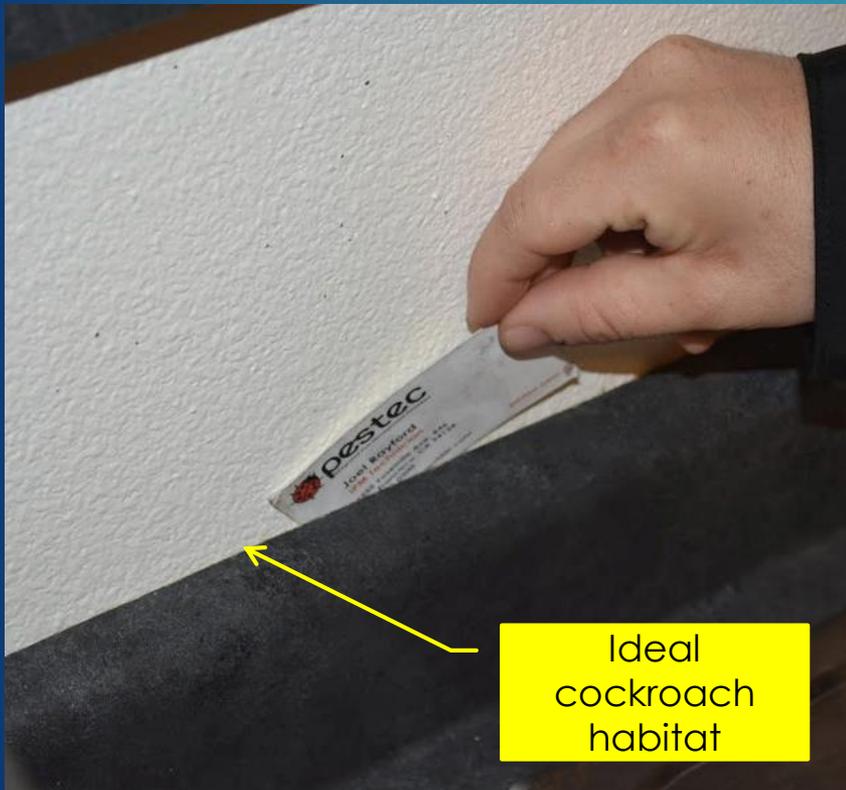
Tools





Seal around countertops and fixtures

- WRONG



- RIGHT



For holes $> 1/4$ inch, use metal wool

- WRONG



- RIGHT



Seal pipe breaks

- WRONG



- RIGHT

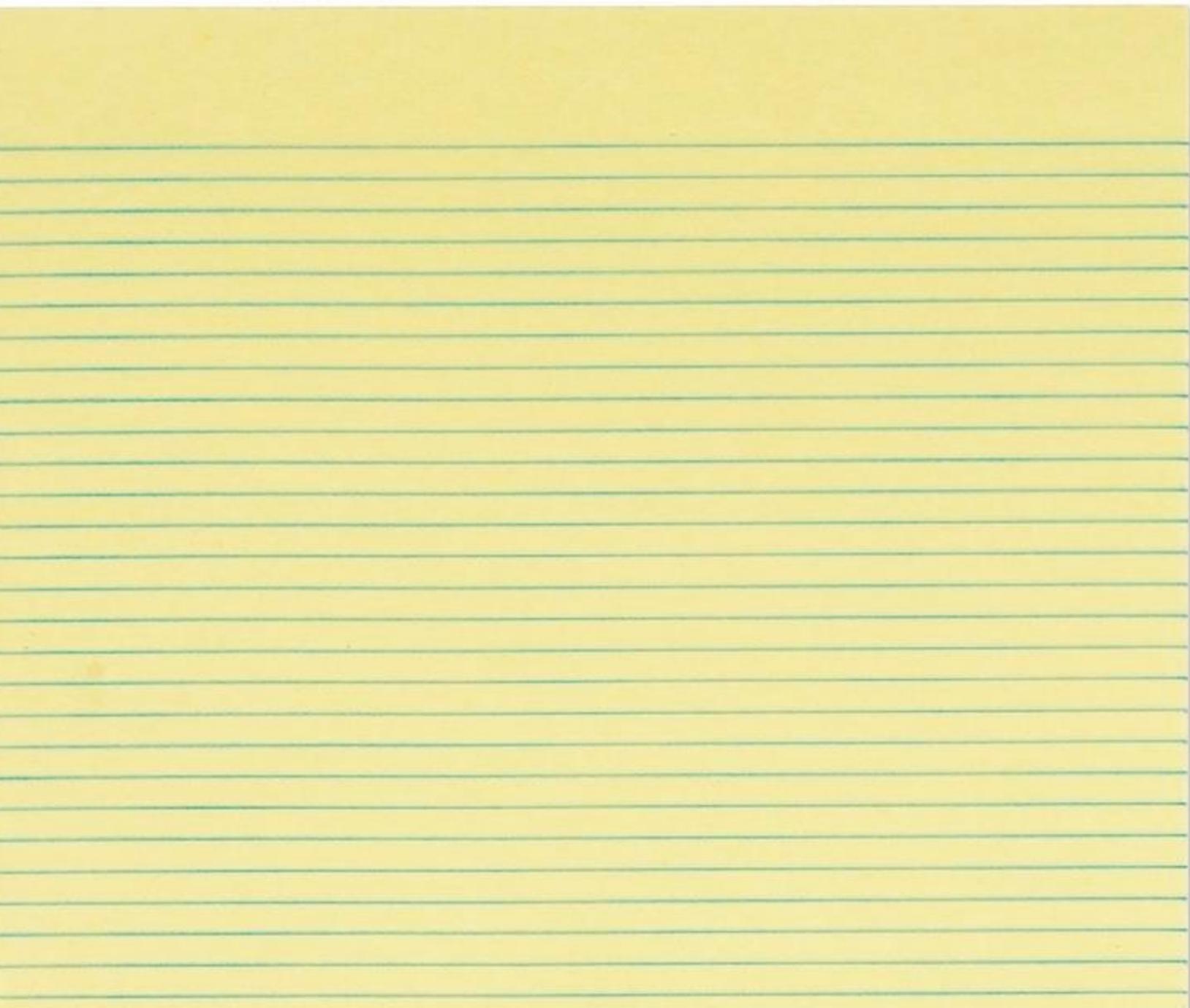


Don't forget outlets



What can happen...





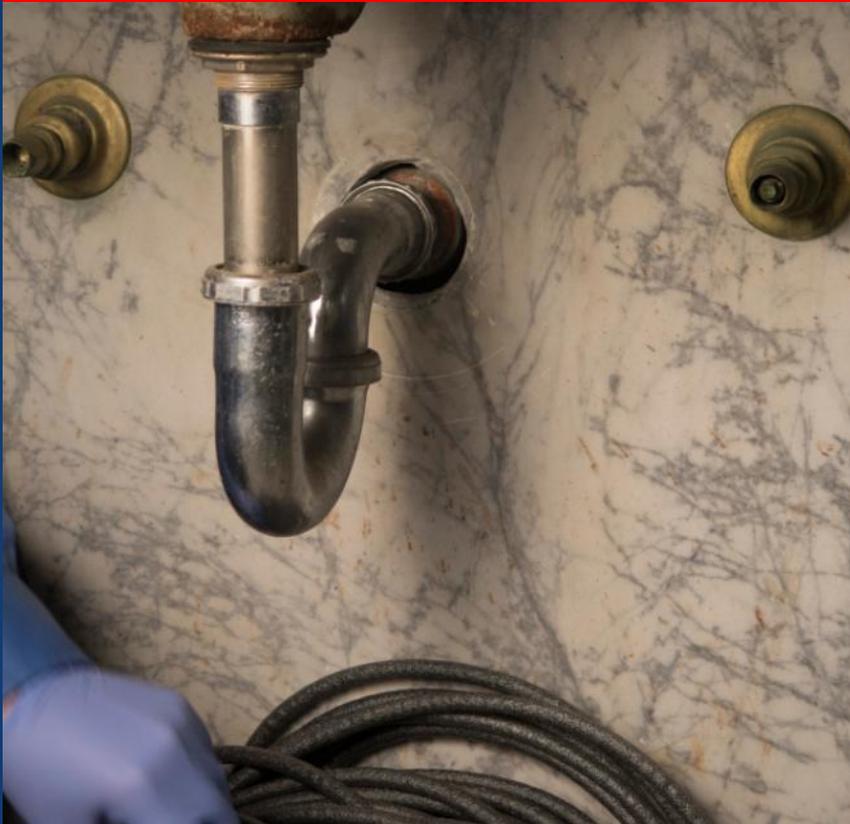
Escutcheonology 101*

*New word courtesy of Bobby Corrigan!



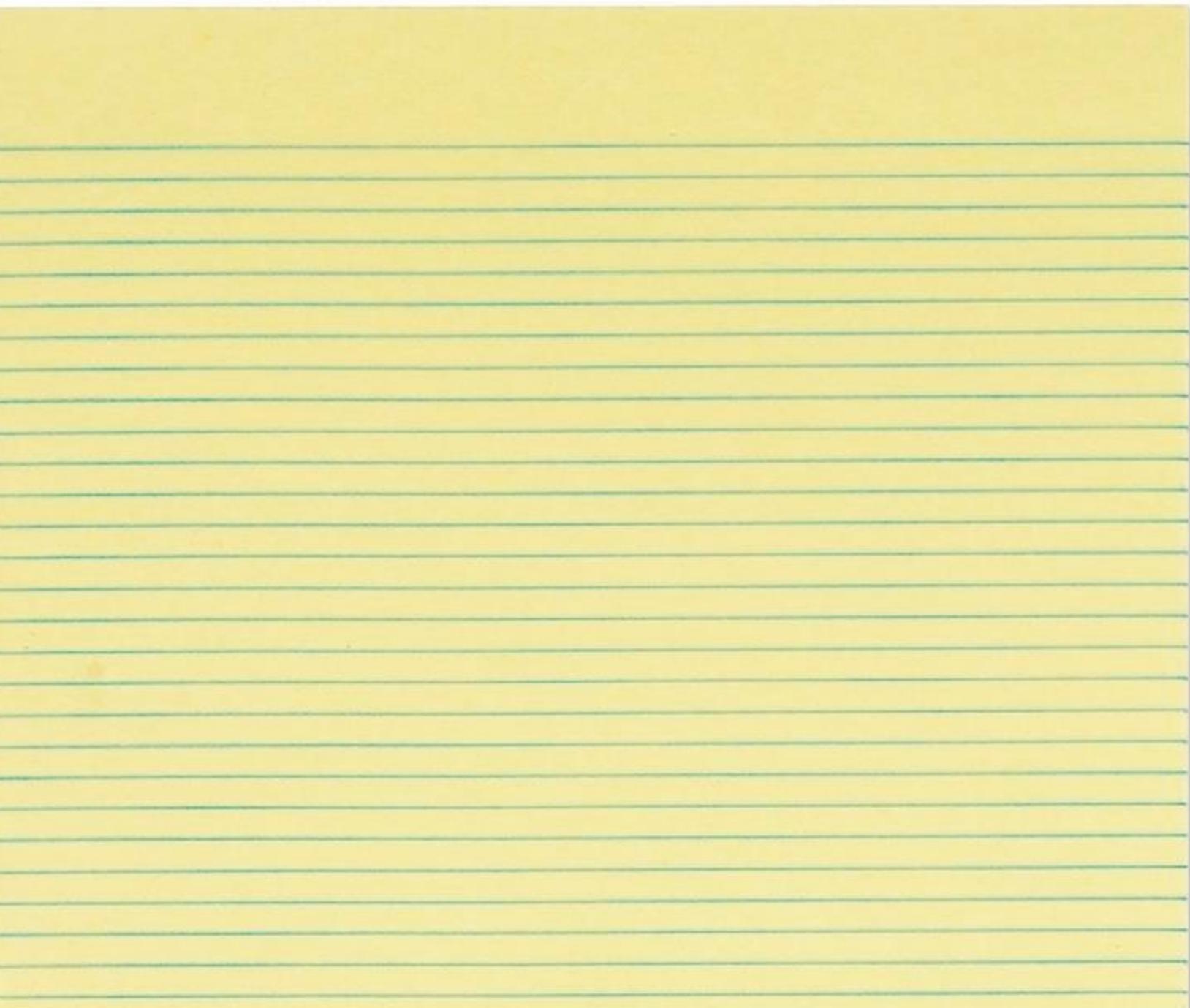
Use escutcheons with sealant

- WRONG



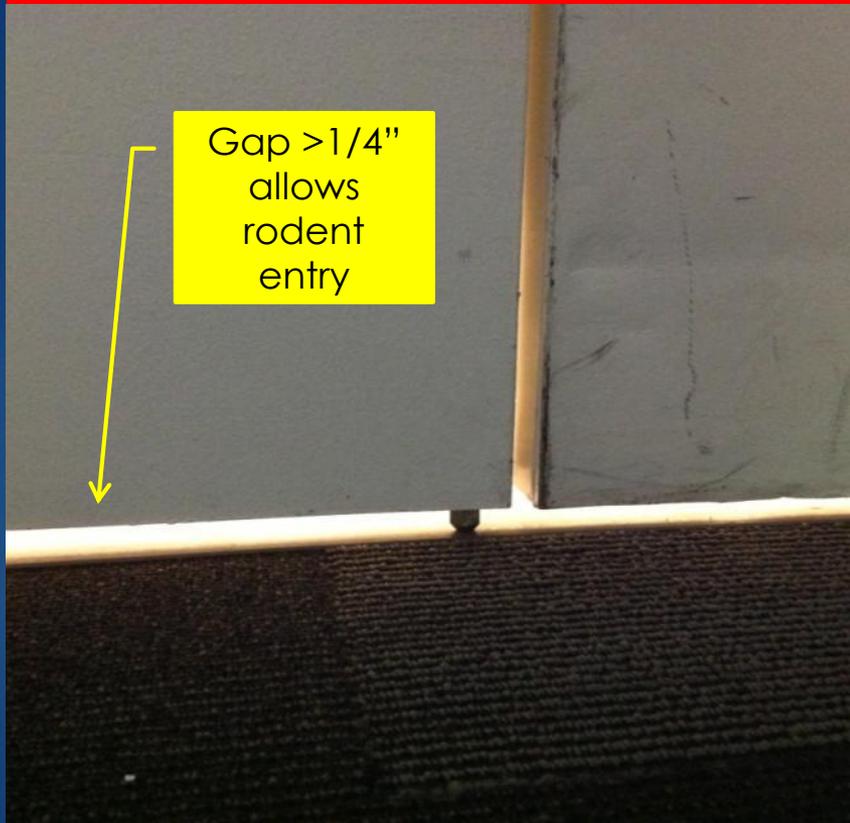
- RIGHT





Install door sweeps

▶ WRONG



▶ RIGHT



Install kick plates

▶ WRONG

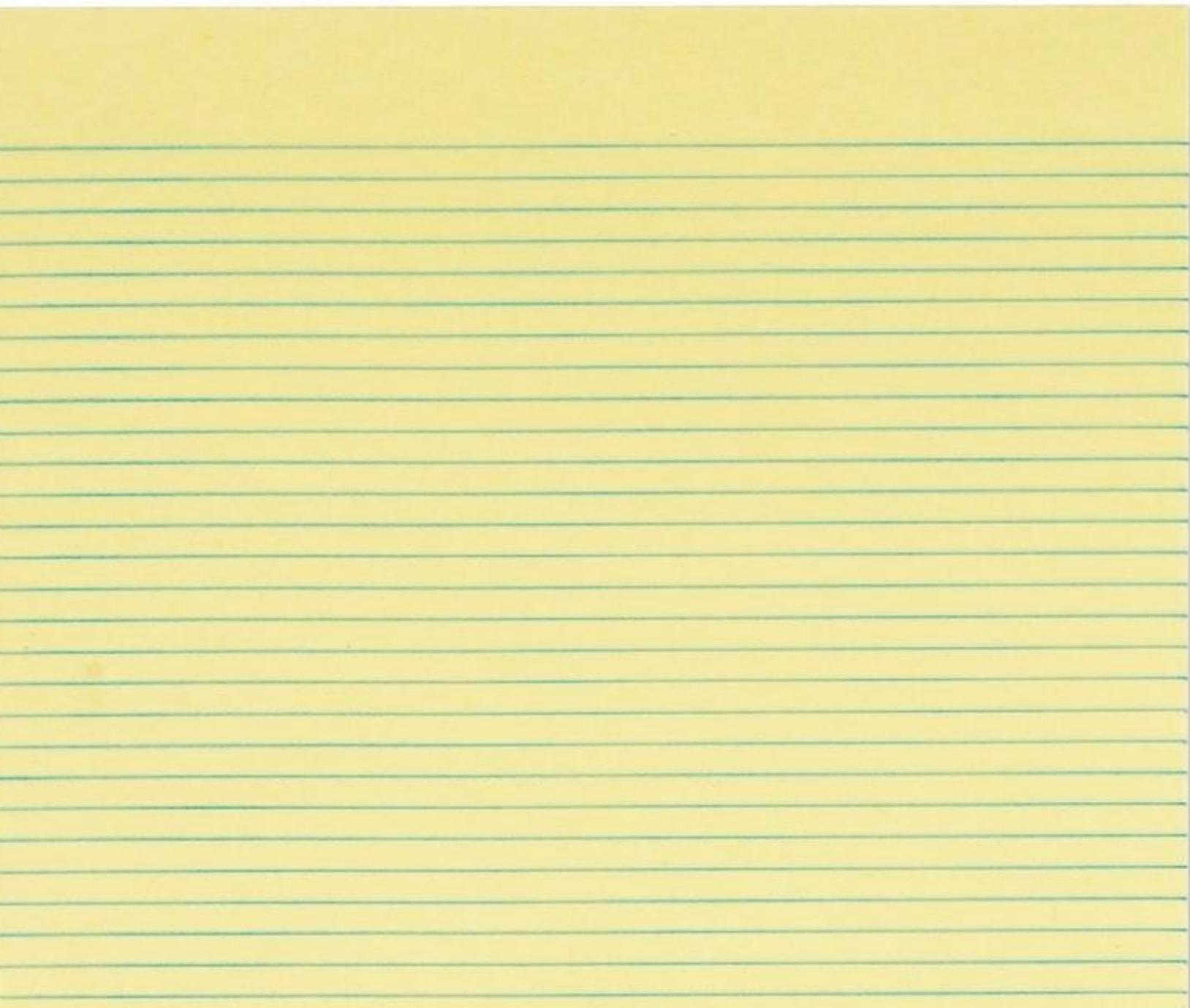


▶ RIGHT



Automatic door sweeps





Holes become highways

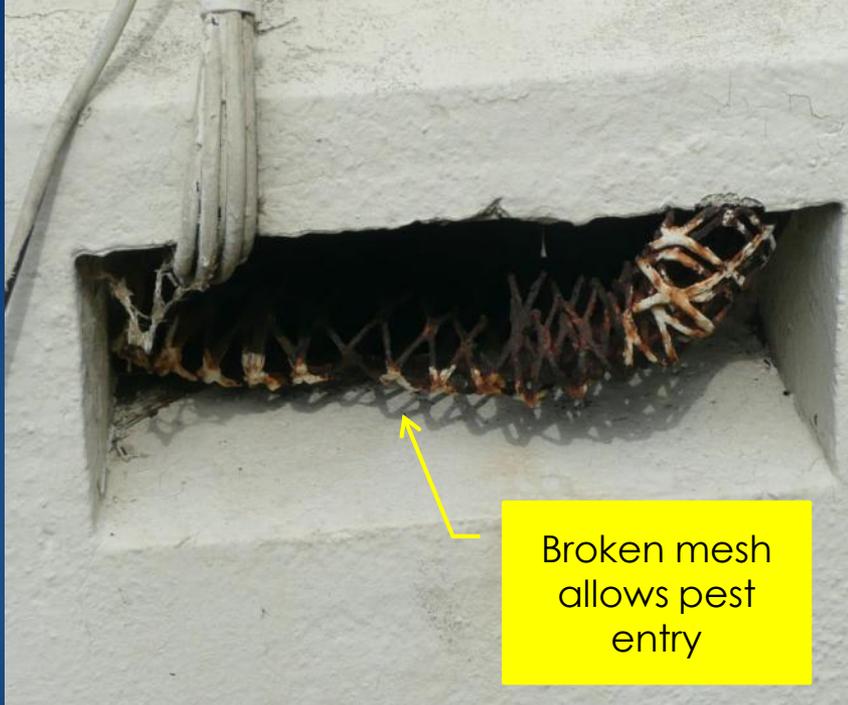


Blocking entry



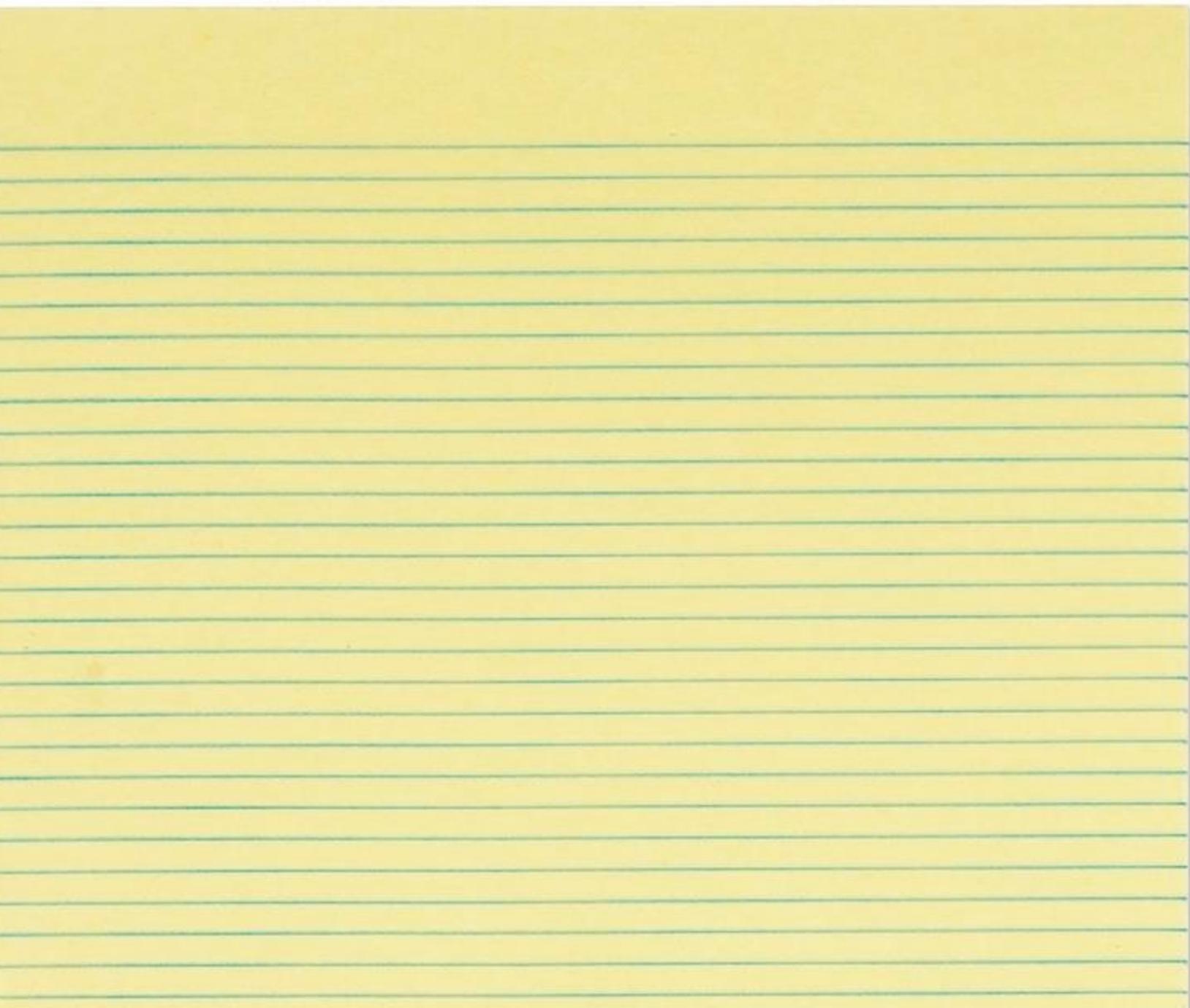
Screen all vents

▶ WRONG



▶ RIGHT





Void spaces are ideal homes for pests



Seal off voids in cabinets

▶ WRONG



Large gap beneath cabinet is impossible to clean, good pest hiding place

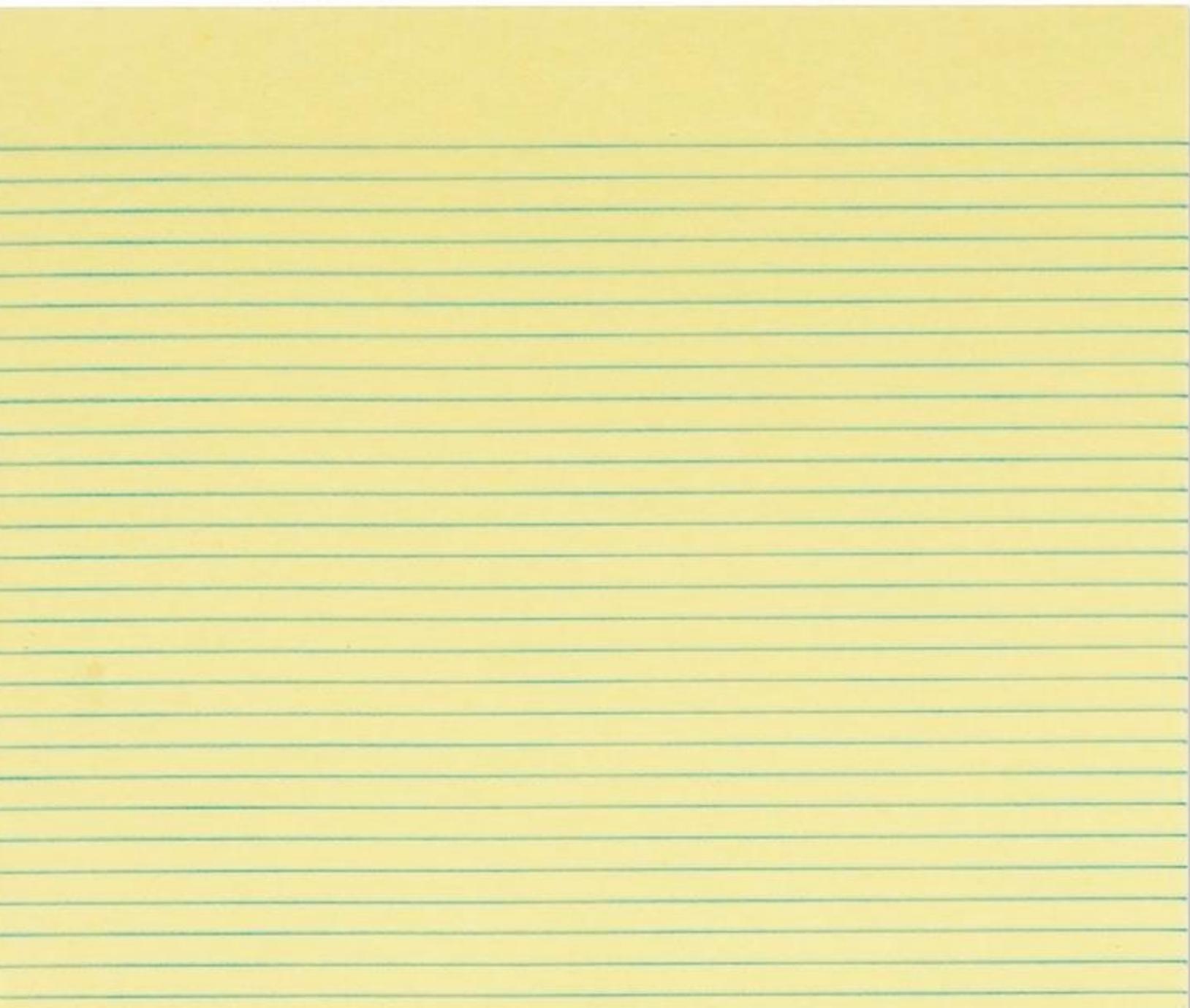
▶ RIGHT



Custom piece seals the gap

Less obvious voids – institutional kitchens





Cheat sheet

A+

- ✓ Mind the gaps
- ✓ Score with sealants
- ✓ Embrace escutcheons
- ✓ Deal with doors
- ✓ Stop them with screens
- ✓ Avoid the void



Pest Prevention by Design

Authoritative guidelines for
designing pests out of structures



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Doors (p. 55)

- 10.1.1 Solid-core doors used
- 10.1.2 12 in. metal kick plates installed (high rodent areas)
- 10.1.3 Exterior doors have < 1/4 in. gap - door sweeps used (REQUIRED)
- 10.1.4 Air curtains installed for frequently opened doors
- 10.1.5 Self-closing mechanisms installed on exterior doors
- 10.1.6 Screen doors with durable frames installed



Windows (p. 58)

- 11.1.1 Exterior window ledges have smooth 45 degree slope
- 11.1.2 Window screens installed for habitable rooms and food prep areas (unless air curtains used)
- 11.1.3 Weather-stripping applied to operable windows



Bedrooms (p. 60)

- 12.1.3 Built-in furniture avoided -or- accessible for inspection
- 12.1.4 Furniture that minimizes attractiveness to bedbugs
- 12.2.1 Openings in floors, walls, and ceilings sealed



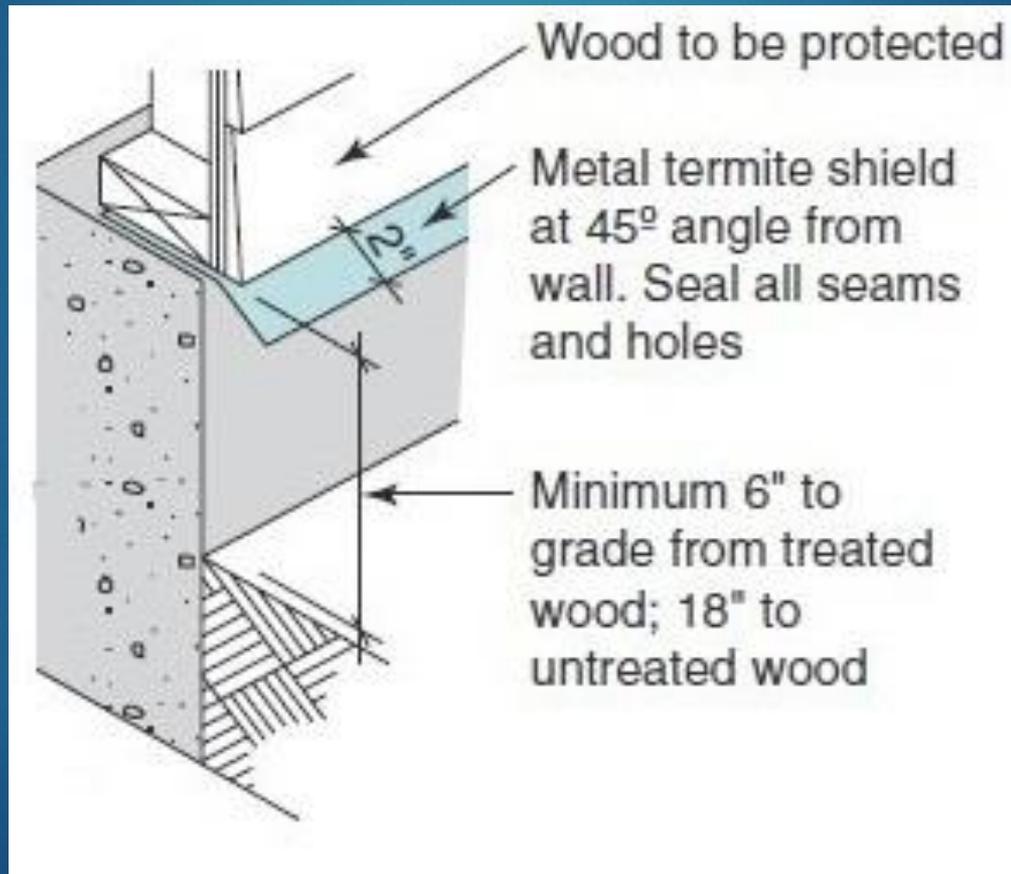
Bathrooms (p. 62)

- 13.1.1 Floor, wall, and ceiling penetrations have escutcheon plates, or foam + copper/stainless steel wool (REQUIRED)
- 13.1.2 One-piece countertops with attached backsplash installed
- 13.1.3 One-piece tub or shower enclosures installed
- 13.1.4 Water controls in showers offset to be closer to door
- 13.1.5 Shower shelves and soap holders sloped
- 13.1.6 Toilets with insulated tanks installed
- 13.1.7 Ventilation ducts sloped
- 13.1.8 Humidistat used with bathroom fans

Design options: Better slabs



Design options: Termite “shields”



Design options: Accessible drains



Design options: Inspectability



Thank you!

<http://sfenvironment.org/download/pest-prevention-by-design-guidelines>



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Authoritative guidelines for
designing pests out of structures

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Questions for our presenters ?



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