



Hazards

The following Hazards section contains information about all of the most common hazards in a playground. Some of these hazards are obvious and some are not. Please read carefully and if there is any confusion or more information required. Refer to www.playgroundideas.org where further resources are available.

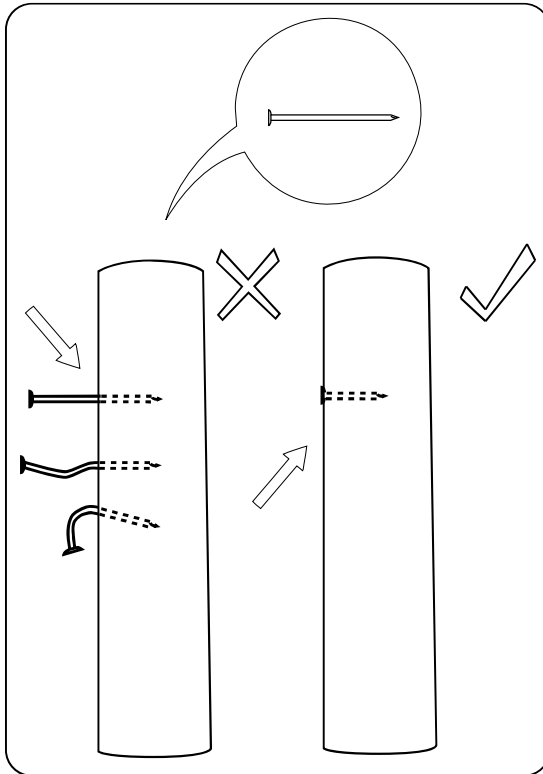
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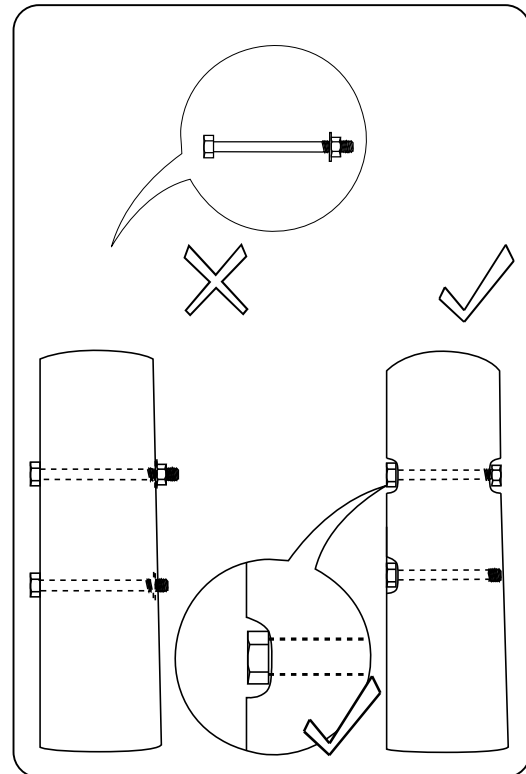
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Sharp Edges, Protrusions And Impalement Hazards

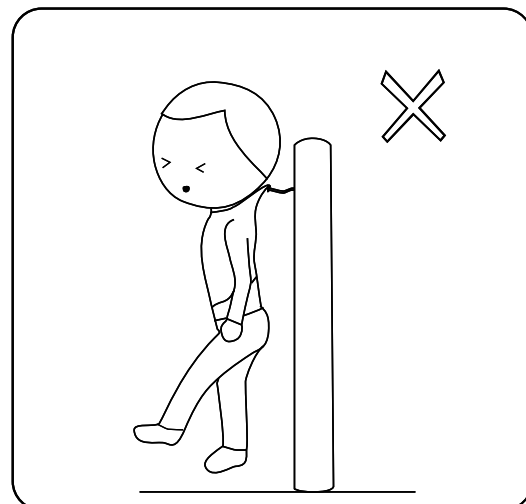
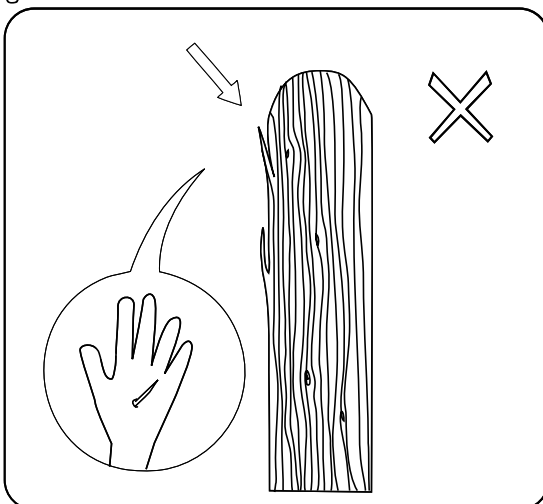
Narrow, small-diameter timbers, rods or other objects that children can collide with or fall onto can cause serious injury and should be avoided.



Sharp protrusions, such as nails, bolt ends, protruding steel reinforcement and splinters, can cause lacerations or hook hazards and should be sanded smooth, ground off or hammered in.



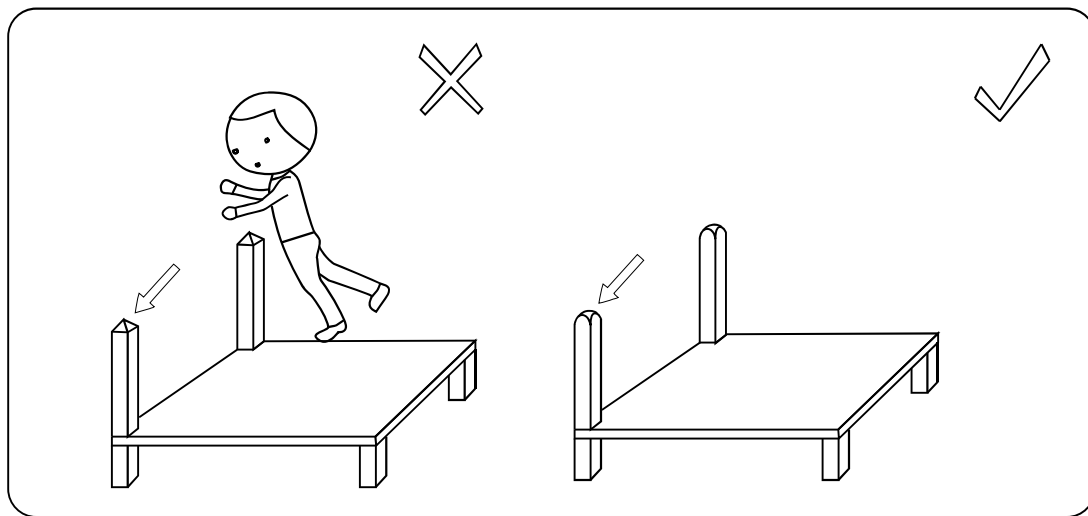
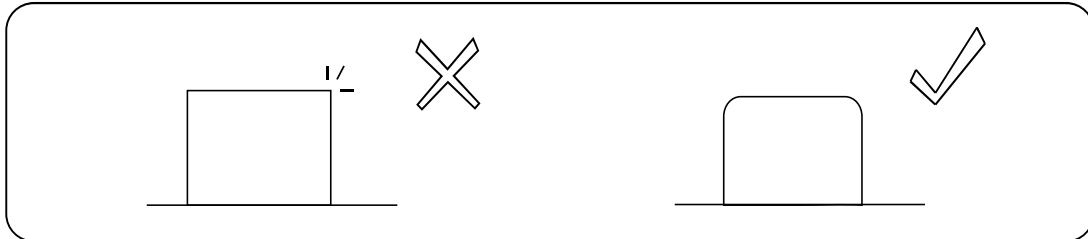
Nails should be avoided. Bolts are preferable and should be recessed, dome-headed and/or cut off less than two threads beyond the nut so they are finished flush with the surface.



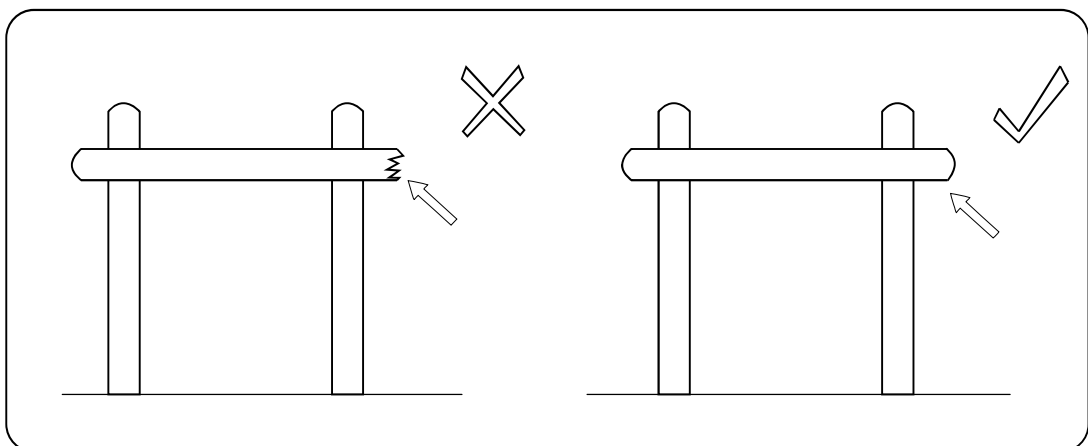


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Sharp edges should be rounded (via grinding, cutting or sanding) to a broad smooth finish that cannot cut. You may also cover certain edges (we use motorbike tire tread pieces) to soften, add grip and prevent injury (e.g. a low entrance to a tunnel is a common place children hit their heads).



Protrusions can also cause penetration or impalement.



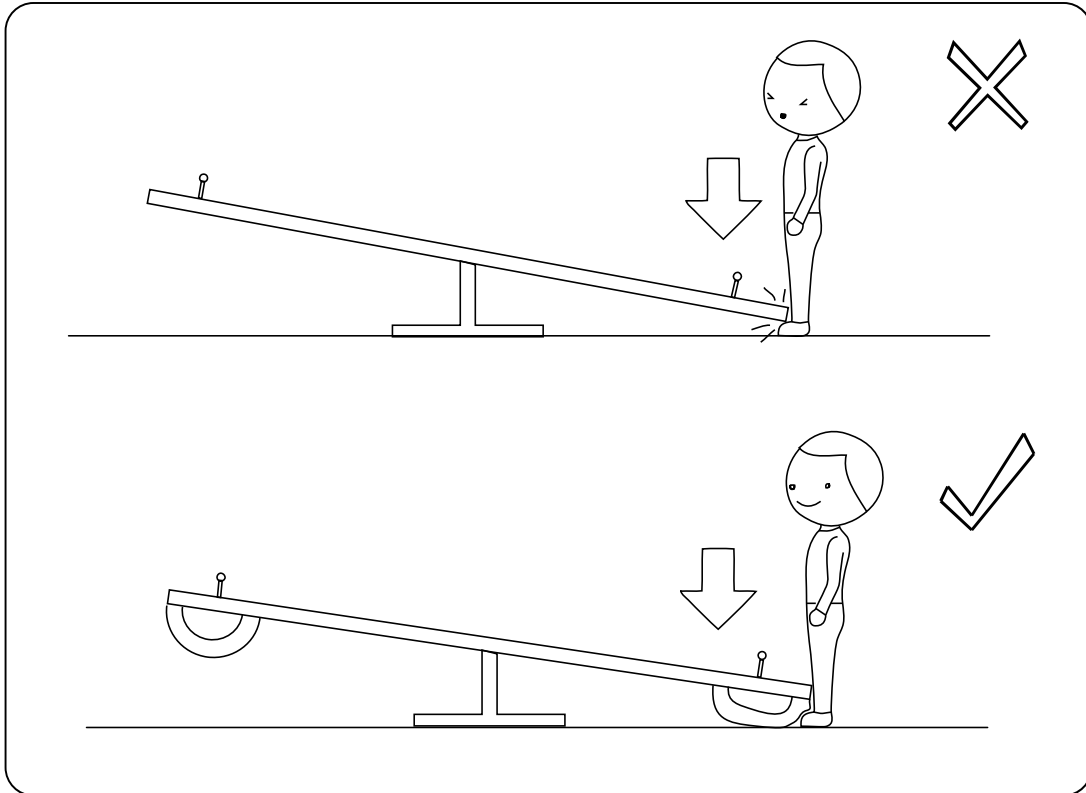
Note that these hazards can also result from broken and damaged equipment, so good, regular maintenance is essential. (See link about Maintenance below). Take special care under decks or in tunnels where it may be darker and protrusions at head height may not be easily seen.



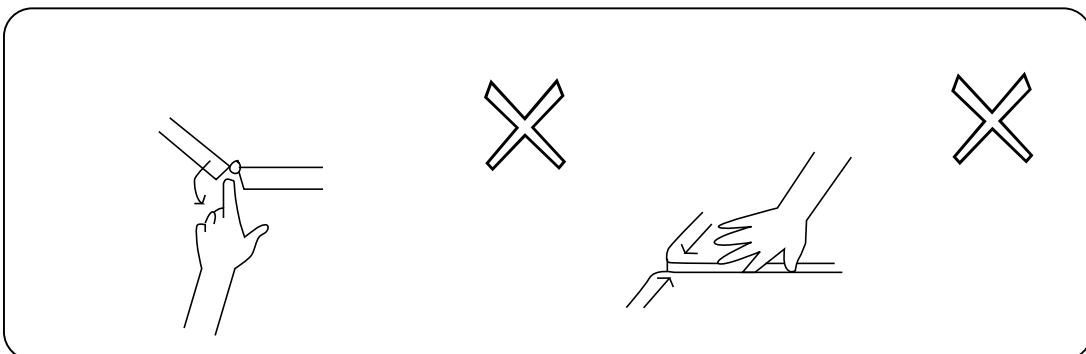
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Pinch, Crush And Shear Hazards

These occur when moving parts of equipment move against one another or against a stationary part, trapping and crushing body parts, such as with rocking elements, see-saws and merry-go-rounds.



Be especially aware of these hazards when they involve high amounts of force. For example, a child putting an arm through merry-go-round netting is a common shear hazard and the central hinge and ends of a see-saw can be a common crush point.



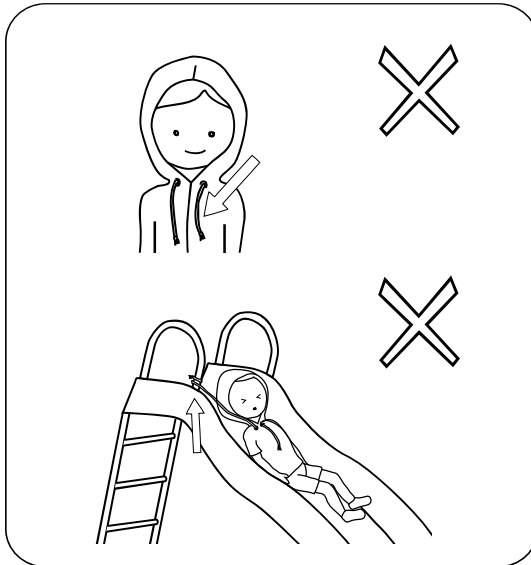
Other common crush points include between moving swing chains and their support posts, between moving swing seats and the ground surface, between springs, and in the spaces of moving "clatter" bridges, if the spaces are inadequate.



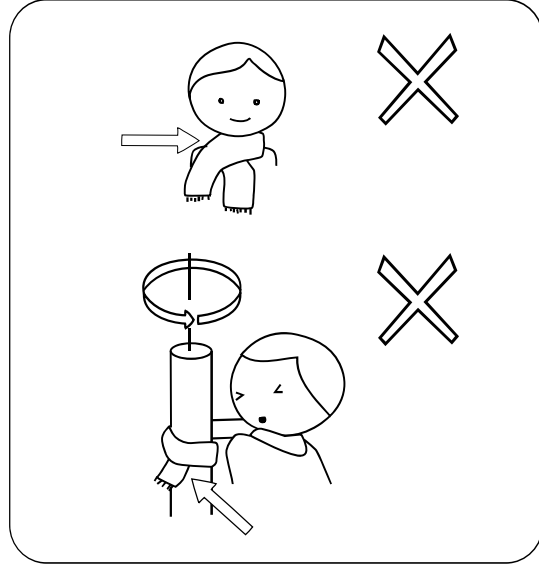
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Entanglement Hazards

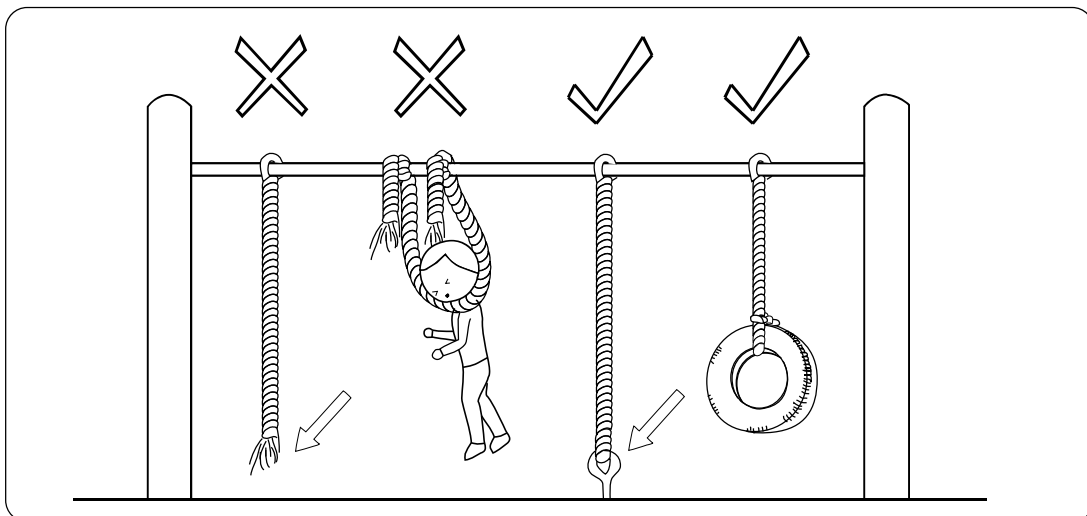
Entanglement hazards are objects that can catch items of clothing or body parts and may cause strangulation as a result. For example, if a hood drawstring catches at the top of a slide that the child slides down, the drawstring may tighten around his neck. Adults should also encourage children not to wear drawstrings (especially around their necks) while on the playground.



These hazards are commonly caused by loose clothing (e.g. drawstrings and cords), skipping ropes and loose playground ropes attached at only one end. Tangling can also occur on spinning equipment with a static center pole, and if children tie loops in ropes.



To avoid entanglements, care needs to be taken with the playground design; to remove small gaps, "V" shaped openings or protrusions that can catch objects, hair or clothing especially where there is "forced movement", such as sliding and swinging. Loose ropes and chains should not be left unattended.



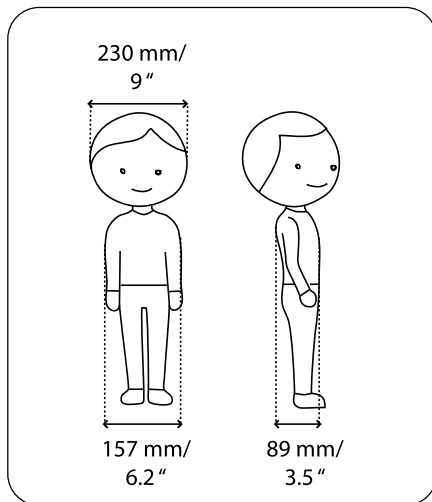


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Entrapment Hazards

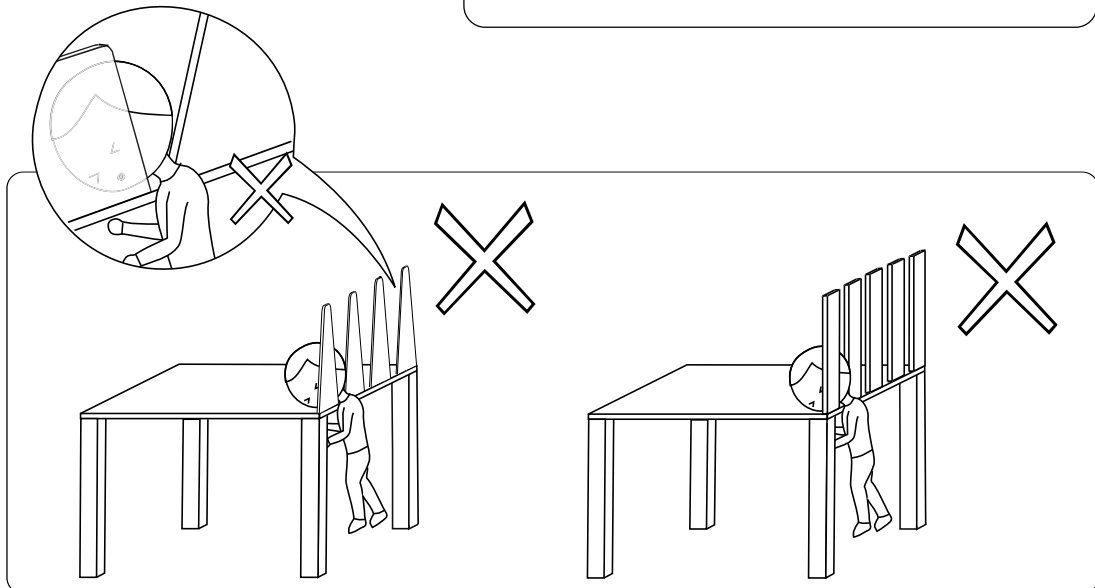
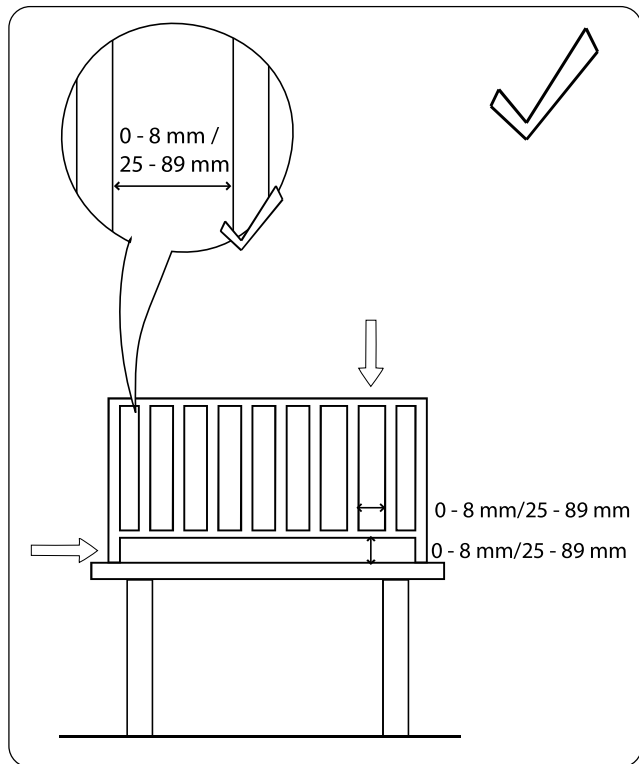
Entrapment is caused when a child's body part (often the neck) gets caught in a space from which it cannot get out. This is only an issue with children because their heads are comparatively larger than their bodies. This type of hazard is the least obvious hazard in a playground, though it can have the most serious consequences.

Head and Neck Entrapment



All openings at least 600mm (23") above the ground need to either:

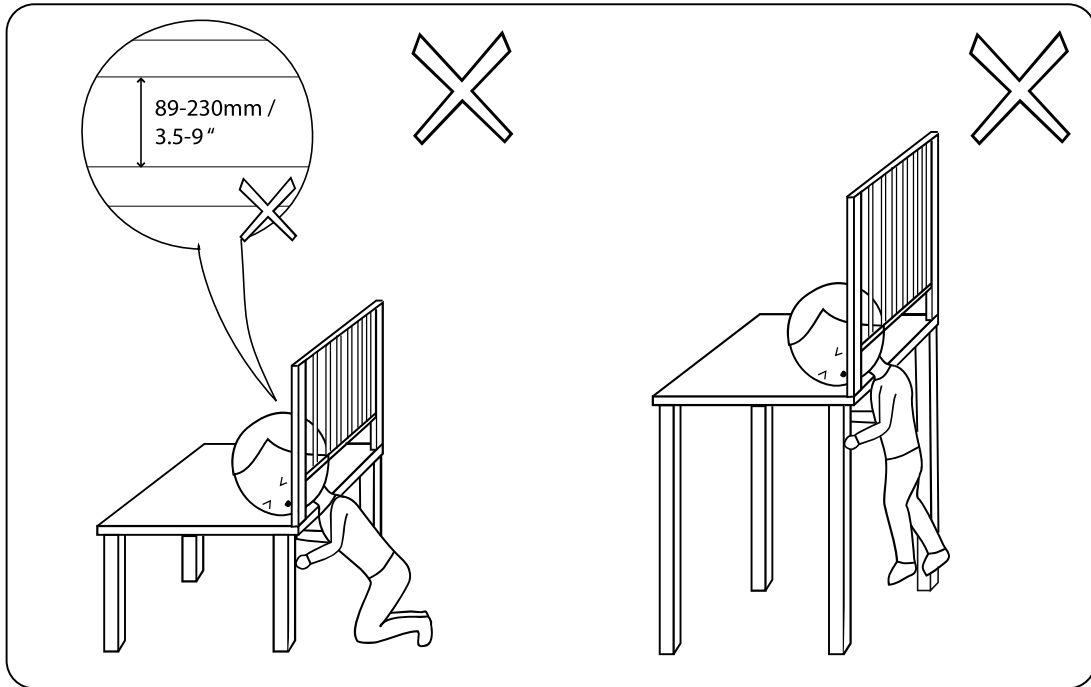
Allow a 230mm (9") "head sized" round disc to pass through easily
OR
be smaller than 89mm (3.5"), to completely stop the passage of a child's body.



Avoid V-shaped openings more than 600mm (23") above ground level, such as between members along the top of a fence or guardrail, where the "V" points downward, because a child's neck or other body parts can get caught in these spaces.



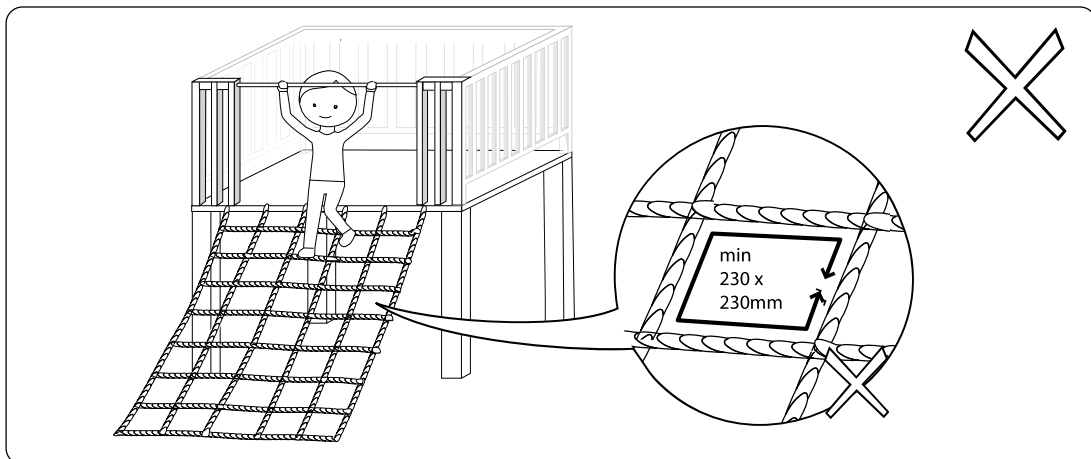
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Entrapment is often caused in the following ways:

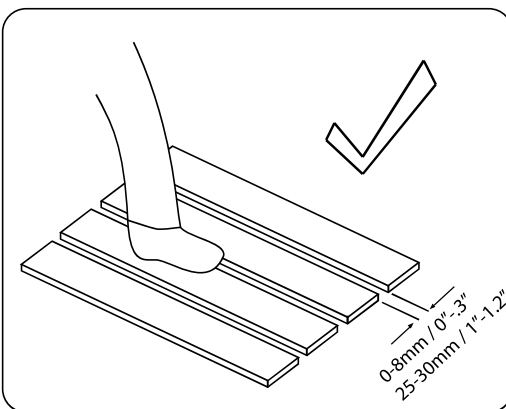
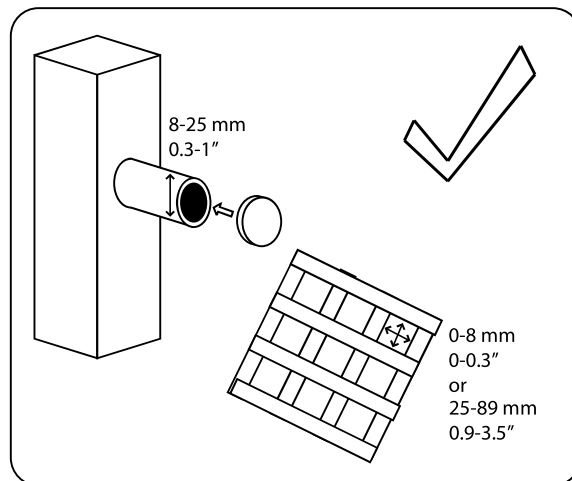
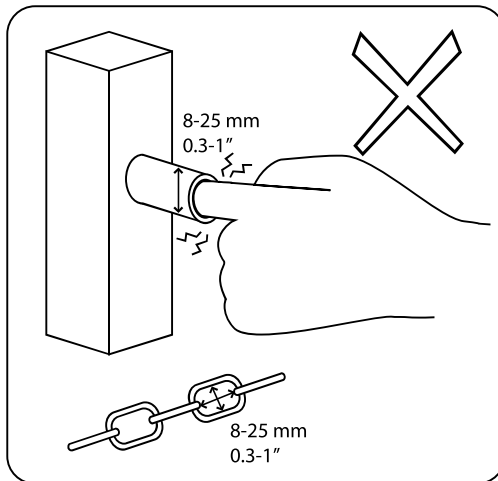
1. Head-First Entry - this “generally occurs when children place their heads through an opening in one orientation, turn their heads to a different orientation, then are unable to get themselves out.”

2. Slip-Through Openings, or Feet-First Entry, involve children slipping through “an opening that is large enough to permit their [feet, legs or] bodies to go through but is not large enough to permit their heads to go through.” (U.S. Consumer Product Safety Commission (2008) p 14, <http://www.cpsc.gov/cpscpub/pubs/325.pdf>)





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Note:

Any part of the body can become entrapped in openings, for example fingers, hands, feet arms and ankles as well as the neck and head. It is very difficult to eliminate openings completely, so care should be taken to consider the likely use of any item and take any necessary precautions. Head and neck entrapment obviously have the most potentially serious consequences.

Entrapment of Fingers

To avoid finger entrapments, openings from 8-25mm (0.3-1") should be avoided. Steel pipes, wooden lattice and chain links in this size range should not be used, or they need to be capped or hammered shut. Swing chains need to be chosen with care to avoid these spaces; and any gaps in merry-go rounds or spinners; as finger entrapment is mainly a hazard when the child's body or the element is moving.

Entrapment of Feet

Avoid foot and ankle entrapments in bridges and platforms by keeping spaces to 0-8mm or 25- 30mm

Entrapment of Whole body.

Children's whole bodies may become trapped (particularly in tunnels) which can become a bigger issue when tunnels are too small for adults to get in and assist. (See tunnel dimensions

Safe tunnel dimensions

Tunnels open BOTH ends				Tunnels open ONE end	
Length	MID*	length	MID*	length	MID
< 15° Inclination		>15° Inclination		No inclination allowed. (must be horizontal)	
<1000mm	>400mm	Any length	>750mm	<2000mm	750mm
<2000mm	>500mm	Must have provision for climbing		tunnels open one end should not be longer than 2000mm	
>2000mm	>750mm				

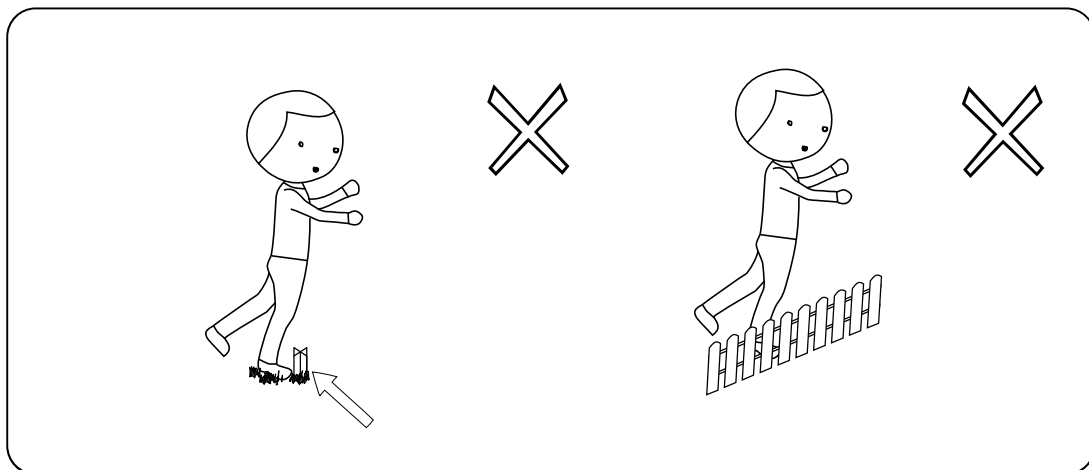
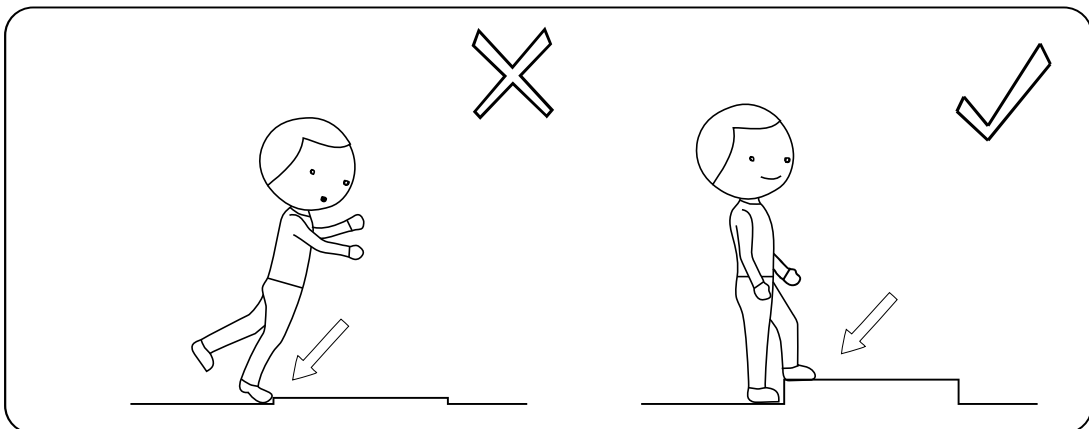
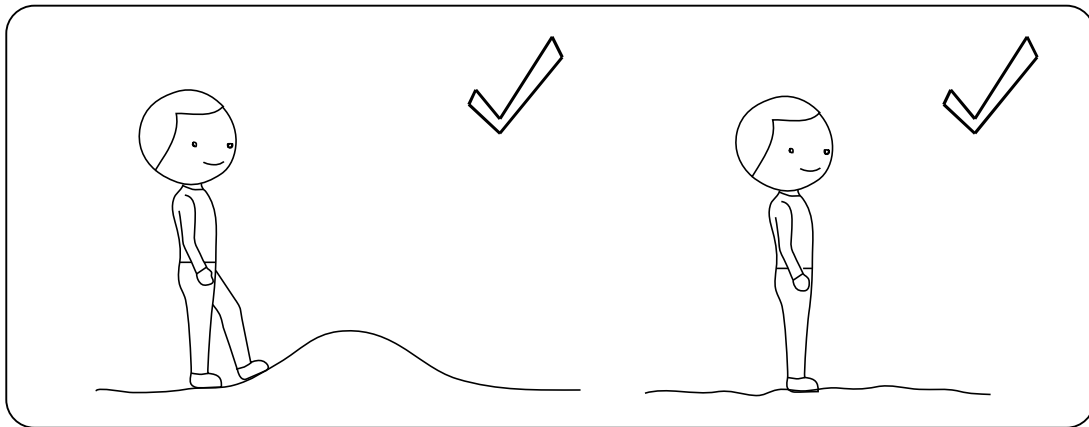
*Minimum Internal Diameter (MID)



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Trip Hazards

Ensure the ground in the play space is free of unexpected tripping hazards like stakes, star pickets and hidden concrete footings. Learning to be agile and coordinated are important skills for a child to master, therefore, having different surfaces is appropriate, but sharp, low objects are hazardous.





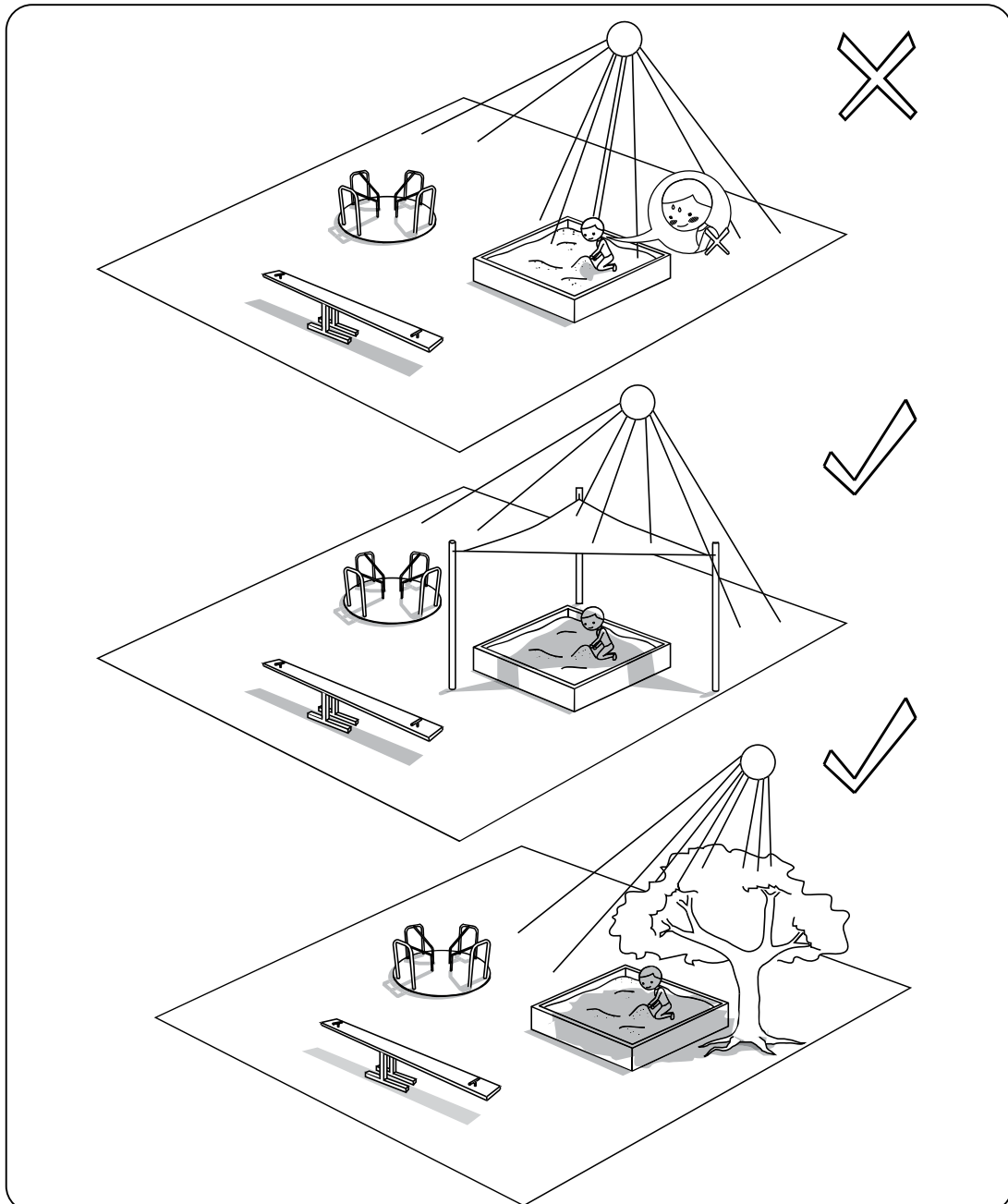
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Shade

Shading should be considered when designing playgrounds to protect children from harsh sunlight (e.g. trees). Designing play structures as a means for providing shading (e.g., elevated platforms with shaded space below), or creating more shade (e.g., shadecloth structure) are potential ways to design a playground to help protect children's skin from the sun.

Drainage

Drainage is also an important consideration especially in regions that have high rainfall or a heavy rainy season. Pools of stagnant water can contain water-borne diseases and be breeding grounds for mosquitos which is linked to malaria etc. Reducing water pooling by leveling ground, creating gutters and trenches for drainage will also limit rot and corrosion to prolong the life and strength of the equipment





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Notes on Materials

The following notes were taken from the European Playground Standards: EN1176-1:2008 on the 8th of June, 2011.

The notes are to supplement the existing materials information in the PlaygroundIDEAS Community Playground Manual.

Flammability:

To avoid the risk of fire and associated hazards, materials known to produce surface flash shall not be used.

Particular attention should be given to newly developed products whose properties might not be fully known.

Dangerous substances

Dangerous substances shall not be used in playground equipment in such a way that they can cause adverse health effects to the user of the equipment.



Prohibited materials include but are not limited to, asbestos, lead, formaldehyde, coal tar oils, carbolineums and polychlorinated biphenyls (PCBs). See the Dangerous Substances Directive 76/769/EEC and its successive modifications.

Metals

Metal parts should be protected against atmospheric conditions and cathodic corrosion.

Metals that produce toxic oxides that scale or flake shall be protected by a non-toxic coating.

Timber and associated products

Timber parts shall be designed in such a way that precipitation can drain off freely and water accumulation shall be avoided.

In cases of ground contact, one or more of the following methods shall be used:

- a) use of timber species with sufficient natural resistance to rot and moisture.
- b) construction methods, e.g. post shoe;
- c) use of timber treated with wood preservatives in accordance with EN 351-1:2007, Figure A.1 and in accordance with EN 335-2:2006, use class 4.

Consideration should also be given to other factors which can be unsuitable, such as splintering, poisoning etc.

All components made of timber and associated products, other than those species conforming to a), that affect the stability of the structure and are in constant contact with the ground shall be treated in accordance with c).

When selecting metal fastenings, consideration should be given to the species of timber and chemical treatments used as some will accelerate corrosion of metals if there is contact between them.

Plywood shall be in accordance with EN 636 and shall be weatherproof.



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Synthetics

If, during maintenance, it is difficult to determine at what point material becomes brittle, manufacturers shall give an indication of the time period after which the part or equipment should be replaced.

It should be possible for the operator of the playground to visually identify excessive wear of the gelcoat of GRP (glass-reinforced plastics) products intended for sliding before the user becomes exposed to the glass fibres.

This can be achieved for example by the use of different coloured layers in the sliding surface.

Consideration should also be given to degradation of structural components through ultraviolet influences.

Water

Except when intended for water play, all parts of playground equipment should be designed so that they do not accumulate water.

Loading

There are many specific requirements that relate to how much load and force the playground equipment should take which have not been covered in this book. Consult local builders and engineers about these standards and if they do not exist be sure to test equipment by overloading it with heavy sacks or adults (if safe) to ensure its strength for children. The equipment should be checked regularly.

Playground Design

Playground design is paramount to safety and to a positive experience for children.

See the design section of our community playground manual for more on good playground design. <http://playgroundideas.org/content/basic-page/playground-manual>

For more information on design and maintenance. see 'design for play' by PlayEngland. <http://www.playengland.org.uk/media/70684/design-for-play.pdf>

The US based, CPSC guidelines, section 2 has further information about the design of a playground. <http://www.cpsc.gov/cpscpub/pubs/325.pdf>

Playground Maintenance

All playgrounds will be affected by 'wear and tear' over time, no matter what they are made of. Good maintenance is critical to ensure children are in an environment that is safe.

For a Maintenance checklist. please see our community playground manual.

<http://playgroundideas.org/content/basic-page/playground-manual>

For The US Playground safety maintenance see Appendix A: Suggested general maintenance checklists" and chapter 4: Maintenance. <http://www.cpsc.gov/cpscpub/pubs/325.pdf>