Kids Don't Float
Cold Water Survival

Grade: 6th through 8th
Time required: 45 – 60 minutes

Program Overview:
This curriculum is based on the primary risk factors in recreational boating in Alaska, laying a foundation of boating safety. The concepts are aligned with Alaska's education and early development standards, and designed for the physical and psychological developmental levels commonly reached at this age. Cold Water Survival teaches the physiological effects of cold water immersion, how to select and properly fit a life jacket, safe boating behaviors, and laws pertaining to life jacket use. Skill-based activities attach experiences to the safety concepts from this lesson. Our program's goal is to familiarize students with how to keep themselves safer when in and around Alaskan waters.

Instructor Note: The Office of Boating Safety tracks the number of participants in the *Kids Don't Float* program. Please contact the office after teaching this lesson. Thank you!
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Certain sections of the lesson appear in blue. These portions are directly related to concepts practiced in the pool session portion of this curriculum.

Goals:

- Participants understand the effects of cold water immersion, the life jacket law in Alaska, and the importance of wearing a life jacket.
- Participants try on at least one life jacket during the lesson.

Essential Questions:

- Why is it important to wear a life jacket?
- What is boating safety?

Objectives:

Participants will be able to:

- Name the first three stages of cold water immersion.
- Describe one survival technique for each stage of cold water immersion.
- State that everyone under the age of 13 is required by law to wear a U.S. Coast Guard approved life jacket in an open boat and on the deck of a boat.
- Describe damage on a life jacket that would make it unserviceable.
- Demonstrate how to check the fit of a life jacket.
- Locate the U.S. Coast Guard approval number on the label on a life jacket.
- State one reason why boating under the influence of drugs or alcohol is dangerous.

Alaska State Standards:

Physical Education Grades 6-8:

E.1 Demonstrate appropriate behavior in physical activity settings.
E.2 Demonstrate concern for safety of self and others during games and activities.
E.3 Demonstrate self-control and sportsmanship/etiquette during games and activities (e.g., accepting controversial decisions).

Skills for a healthy life:

A.2. Understand how the human body is affected by behaviors related to eating habits, physical fitness, personal hygiene, harmful substances, safety, and environmental conditions.
A.3. Understand and identify the causes, preventions, and treatments for diseases, disorders, injuries, and addictions.
A.6. Use knowledge and skills related to physical fitness, consumer health, independent living, and career choices to contribute to well-being.
B.1 Demonstrate an ability to make responsible decisions by discriminating among risks and by identifying consequences.

Vocabulary:

Cold Water Immersion: When the body is immersed in water colder than 70°F.

Core Body Temperature: The temperature deep inside the body, as opposed to that of the skin.

Cold Shock Response: Effects within the first three minutes, which may include gasping, hyperventilation, vertigo, and changes in blood pressure, heart rate, and rhythm.

Cold Incapacitation: Effects within the first 30 minutes, when arms and legs begin to lose sensation and function (may become numb and muscles become weaker).

Immersion Hypothermia: Effects begin after 30 minutes or more, when core body temperature begins to drop.

Serviceable Condition: A life jacket that is free of rips and holes, the flotation material that is not squished or showing, and with straps, buckles and zippers that all work.

Vasoconstriction: The constriction of blood vessels.

Vasodilation: The widening of blood vessels.

Materials Needed:

- "Cold Water Survivors" video available online at: AlaskaBoatingSafety.org
- *Kids Don't Float* teaching kit (off-shore, near-shore, buoyancy aid life jackets)
- *Kids Don't Float* Cold Water Survival Quiz. Online at: AlaskaBoatingSafety.org
- *Kids Don't Float* Instructor Evaluation. Online at: AlaskaBoatingSafety.org

Introduction (20 minutes):

- Ask participants: What is their favorite type of boating activities? Get their perspectives on what gets them on the water: what types of boats and activities do they enjoy? Some people in Alaska boat for transportation and for subsistence activities such as hunting, fishing, berry picking, or gathering wood.

- Introduce the video **Cold Water Survivors** (12 minutes)
    - The movie details a boating accident on Tustumena Lake in 2011 narrated by two local teenagers. Let participants know that if they are uncomfortable at any time they may step out of the room or talk to the teacher.

- Ask participants: What are some ways that people can demonstrate safe boating behavior?

<u>Why should participants learn about boating safety?</u>

- Five of six recreational boating fatalities in Alaska are due to swamping, capsizing, or falling overboard. These accidents happen quickly and there is little or no time to put on a life jacket.

<u>What could affect how quickly someone gets cold when in cold water?</u>

- Speed of immersion
- Pre-existing medical conditions
- Protective clothes
- Water conditions
- Habituation

The First Three Stages of Cold Water Immersion (15 minutes):

Although there are four stages of cold water immersion, the video focuses on the first three. Ask participants if they can recall the first body reaction when a person falls in cold water.

I. **Cold Shock Response**: When a person first falls into cold water, he or she may gasp. After the initial deep, quick breath, victims begin to take short quick breaths known as hyperventilation. Other effects may include vertigo and changes in heart rate and blood pressure.

a. Within the first three minutes, wait for the effects of the Cold Shock Response to subside.

b. What will help keep the head above water while waiting for breathing to return?

Wearing a life jacket helps a person maintain a clear airway.

Ask participants if they can recall the next stage of cold water immersion from the video.

II. **Cold Incapacitation**: The second stage of cold water immersion is Cold Incapacitation. Within the first ten minutes, localized cooling occurs in the arms and legs and affects muscles and nerves causing loss of sensation (numbing) and function (dexterity). This is due to vasoconstriction, or the constriction of blood vessels, which reduces blood flow to arms and legs. Prioritize and perform the most important survival functions first.

a. Tighten the life jacket. Life jacket fit may change when clothes and life jacket become wet.
b. Get help. Blow a whistle, wave both arms, or use an emergency communication or distress signaling device.
c. Try to get out of the water. Grab onto something nearby and get out of the water as much as possible.
d. Assess the situation and make a plan. If in open water, decide whether or not to swim to shore.

When to swim	When not to swim
-If you are wearing a life jacket -If your boat sinks -If you are physically able and uninjured -If the accident was not witnessed by others -If you are in an area of low boat traffic -If you are confident you can make it to shore (less than 800 yards) -If you are unable to signal for help	-If you are not wearing a life jacket -If your boat is still afloat and can be used to get out of the water -If someone is injured -If the accident was witnessed - If you are in an area of high boat traffic, where a swift rescue is likely - If rescuers have been contacted and are on their way -If you are unsure you can make it to shore, and distance is more than 800 ft.

If participant is a rescuer, remember that victims may not be able to effectively use their fingers. Encourage victims to use larger muscle groups, such as hugging arms around a throwable Personal Floatation Device (PFD).

* If not wearing a life jacket, there is a higher risk of drowning.

III. **Immersion Hypothermia:** The third stage of cold water immersion is Immersion Hypothermia. Normal core body temperature is approximately 98.6 ° Fahrenheit. Hypothermia is when a person's core body temperature drops below 95.0 °F. Emphasize that it is possible to survive hypothermia. Hannah and Miranda Udelhoven were in the water for four and a half hours and did not sustain lasting physical effects.

a. Stay positive!
b. Continue plan developed in stage two.
c. Be prepared to activate visual distress signals when potential rescuers are in range.
d. Reduce heat loss by keeping movements to a minimum or get out of the water.
e. In open water:
   i. If swimming, do so efficiently using a modified backstroke.
      1. This stroke helps protect high heat loss area, armpits and inner thighs reducing heat loss and conserving energy.
      2. Keep upper arms and elbows close to the sides of chest, upper legs close together and knees slightly bent.
      3. Use floating objects to help pull body out of the water as much as possible or assist with swimming.
   ii. If not swimming, get into the Heat Escape Lessening Position (HELP) or huddle position.

1. Keep elbows by sides, squeeze legs together, and tuck knees up while still maintaining position in the water to help reduce heat loss. Encourage students to try this in the water to help discover optimal position.
2. The HELP position may be useful, but is only possible if wearing a life jacket.
3. With other people, huddle together. This will help people stay warmer, stay together, and make it easier for rescuers to spot.

f. If in a river or other moving water: point feet downstream with knees bent slightly and feet up to avoid foot entrapment.

i. Maintain body at 45-degree angle to the current, with head pointing to the bank of choice.
ii. The force of the current on the upstream side will help "ferry" toward that bank.
iii. Use a modified backstroke and be prepared to fend off rocks and other objects.
iv. If necessary, be prepared to quickly flip onto stomach and into head-first position to scramble over "strainers" or other obstacles to keep from being pulled under or becoming pinned against them by the current.

Wearing a life jacket may increase survival time.

1-10-1 Principle: (Remember this is a general guideline. Times vary for each individual and environment.)

a. Within one minute, wait for the effects of the Cold Shock Response to subside.
b. Within 10 minutes prioritize and perform meaningful activity.
c. One hour (or more) to focus on self-rescue. Stay Positive!

*** Wear a life jacket, and stay positive.*

Optional Activity: Chill Out Relay (See Appendix A)

Alcohol and Boating

Ask participants if they know what percentage of boating fatalities involve alcohol.
-Twenty-eight percent of Alaska's boating fatalities involve alcohol.

In Alaska, the laws that define driving while intoxicated, and the penalties for a conviction, apply to boat operators too.

* *Judgment* - operators under the influence are more likely to take unnecessary risks and make bad decisions.

* *Reaction Time*- In an emergency, sharp reflexes and quick action can save the day. Alcohol dulls reflexes and slows reaction time.

* *Vision* - Alcohol can seriously affect an operator's peripheral vision, night vision, and ability to focus.

* *Balance* - Most alcohol related boating deaths involve a fall overboard into cold water.

Alaska Life Jacket Law

Ask participants if they know who has to wear a life jacket according to the law.

EVERYONE UNDER THE AGE OF 13 IS **REQUIRED TO WEAR** A U.S. COAST GUARD APPROVED LIFE JACKET WHEN IN AN OPEN BOAT OR ON THE DECK OF A BOAT.

However, everyone — even excellent swimmers and experienced boaters — <u>should</u> always wear a life jacket. Life jackets are the single most important factor for survival in cold water.

a. They help maintain airway
b. Some slow heat loss
c. They extend survival time
d. They assist in self-rescue

<u>How to inspect and fit a life jacket</u>

1. Read the label on the life jacket. Make sure it is U.S. Coast Guard approved, the proper size for wearer, and made for the intended activity.
2. Life jackets must be in "serviceable condition."
    a. Make sure there are no rips or holes, flotation material is not squished or showing.
    b. Check that straps, buckles, and zippers all work.
3. Fasten all straps, buckles, and zippers.
4. Adjust for a snug, comfortable fit. To check, pull up on shoulder straps to see if straps rise above the ears. If so, tighten straps for a snug fit.

<u>Off-Shore Life Jacket (Type I)</u>

How to identify:

1. Locate the U.S. Coast Guard approval number
2. Read the label for specific instructions and intended use. Off-shore life jackets are not appropriate for impact activities such as water skiing, personal watercraft, and towing sports such as tubing
3. Bright orange color, with highly visible reflective tape

Function:

1. Turns most unconscious wearers face-up in water
2. Recommended for use in rough, open or remote waters
3. Normally has the most flotation material which means it floats the wearer highest in the water

Near- Shore Life Jacket (Type II)

How to identify:
1. Locate the U.S. Coast Guard approval number
2. Read the label for specific instructions and intended use. Not appropriate for impact activities (water skiing, tow sports i.e. tubing, or personal watercraft)
3. Bright orange or other bright colors

Function:
1. Intended for calm, inland waters, areas where there is a good chance of quick rescue
2. Turns some unconscious wearers face up in the water

Buoyancy- Aids, Vests, Float Coats (Type III)

How to identify:
1. Locate the U.S. Coast Guard approval number
2. Read the label for specific instructions and intended use. Some styles are not designed for impact activities or tow sports

Function:
1. Not guaranteed to turn a wearer face-up in water
2. Wide range of sizes and colors available
3. Most are very comfortable

Optional Activity: Life Jacket Fashion Show (See Appendix B)

The best life jacket is the one you wear!

Assessment Plan:

Skill check, participants are able to:

- Explain the first three stages of cold water immersion.
- Identify at least one important survival strategy associated with each stage.
- Identify two features that would make a life jacket unserviceable.
- Check their own life jackets for proper fit.
- Identify at least one effect of consuming drugs and alcohol that would be detrimental in a boating accident.

Prompts to check for understanding:

- Describe the three stages of cold water immersion.
- Who is required by law to wear a U.S. Coast Guard approved life jacket in an open boat or on the deck of a boat?
- Who should wear a life jacket?
- How does one know if a life jacket is U.S. Coast Guard approved?
- State one reason why it is dangerous to consume drugs or alcohol while boating.

Chill Out!

Purpose: To demonstrate the physical effects of cold water on the body, loss of fine motor skills, and numbness in fingers.

Materials:
- A bucket or a clean container
- 1 bag of ice or enough ice/snow to fill the container
- Hand towel or paper towels for drying hands
- Life jackets

Objectives:
Experience what cold water feels like in a safe, controlled environment.
Experience how cold water affects dexterity.

Alaska State Standards:

Physical Education Grades 3-5:

E.7. Describe appropriate reactions to threatening and/or emergency situations common to physical activity settings (e.g., bear or moose on playground).

E.9. Select appropriate safety equipment for specific physical activities (e.g., bike helmet, personal floating device).

WARNING: Some people have certain health risks related to this activity; ask participants if anyone has a health condition related to cold prior to beginning this activity. Please do not make this a mandatory activity. Monitor length of time in the water and excuse those who demonstrate discomfort.

Procedure:
1. Put ice or clean snow in the bucket or container and fill ¾ full with cold water.
2. Gather participants around the bucket and have them form two or three lines.
3. Have the participants take turns putting their hands in the ice water.
4. Then have them put on the life jacket and fasten the buckles as quickly as possible.

*Two to three participants can do this activity at a time.

Discussion points:

1. What is the first reaction when a person's arm enters the water?

Cold shock. The gasp may not be as pronounced because it is just part of the body instead of complete immersion.

2. How does the person's arm feel after a few seconds of being in the water?

Loss of feeling in fingers makes it hard to put on a life jacket in the water. This is one important reason why participants should wear a life jacket at all times.

3. Would it be difficult to buckle buckles, zip zippers, or pull straps on the life jacket when in cold water?

YES! During the second stage of cold water immersion, blood flow is restricted as blood vessels constrict causing loss of feeling and dexterity.

4. Was anyone wearing a sweatshirt or jacket when putting on the life jacket? Did that make it harder to get the life jacket snug?

It is common to wear warm clothes when boating in Alaska, so it is important to make sure that the life jacket fits over all of the layers that someone is wearing.

The best life jacket is the one you wear!

Life Jacket Fashion Show

Purpose:
This activity showcases different types of life jackets, how they are worn, special features of each life jacket, and the intended use. It prompts discussion that not all life jackets are created equal and understanding the different features can help make informed decisions about the best life jackets for specific activities.

Objectives:
Demonstrate how to properly fit a life jacket.
Choose the appropriate type of life jacket for the desired activity.

Materials:
At least one of each the following life jackets:
- Off-shore
- Near-shore
- Near-shore buoyancy aid (vest style)

Alaska State Standards:
Skills for a Healthy Life:
A.1. Understand that a person's well-being is the integration of health knowledge, attitudes, and behaviors.

B.5. Evaluate what is viewed, read, and heard for its effect on personal well-being.

Procedure:
1. Choose "life jacket models" to wear life jackets. If possible, have one to three students per life jacket type.
2. Tell the students what type of life jacket they have.
3. Ensure that life jackets are properly fit by pulling up on shoulder straps or neck collar to make sure that the life jacket does not come up over the ears.
4. Have two participants be the hosts/ hostesses who will read information about each life jacket from the script on the following page.
5. As one type at a time is called down the "runway," the hosts discuss uses and features of each life jacket.
6. Review with participants that information about size, intended use, and U.S. Coast Guard approval number is found on the manufacturer's label.

Discussion:
1. What is the best life jacket?
   The best life jacket is the one you wear.
2. Where can someone find out if a life jacket is U.S. Coast Guard approved?
   Read the life jacket label and locate the U.S. Coast Guard approval number.

Optional Narrative:
Host 1: Ladies and Gentleman, welcome to today's life jacket fashion show! I am (introduce yourself).

Host 2: And I am (introduce yourself). And we will be your hosts for this exciting event.

Host 1: Now let's welcome out our first group sporting our Off-Shore life jackets!

Host 2: These life jackets are really something! Look at the fabulous orange color accented by those dazzling reflectors. Those will definitely make a wearer more visible to a search and rescue team.

Host 1: This life jacket is also designed to roll most unconscious wearers face-up out of the water. This is just a spectacular feature. Now let's bring out our Near-shore life jacket. Easy-on with a single strap securing the lovely life jacket to your body. This design is to be enjoyed on those waters close to land and the likelihood of a quick rescue.

Host 2: It sure is thinner than those off-shore life jackets we just saw. These look much more comfortable to be moving around in, and speaking of comfy, here come our Buoyancy Aid life jackets: the vests!

Host 1: These kids look ready for a full day of fishing at the lake. This life jacket is so comfortable but has the least amount of flotation. The design is for waters close to land and quick rescue.

Host 2: Remember that even with a life jacket, you should only go near the water with a responsible adult. Alaska's cold water can be dangerous. All children under the age of 13 are required by law to wear a life jacket in an open boat or on the deck of a boat, but shouldn't everyone?

Host 1: Yes, everyone should wear a life jacket, because the best kind of life jacket is….
All participants: THE ONE YOU WEAR!

Host 2: That concludes our fashion show folks. Please join us in giving our wonderful models a final round of applause.

*Make sure to mention the functions of each of the different kinds of life jackets and the importance of a snug and comfortable fit.

Life Jacket Relay Race

Purpose: For students to experience the difficulty in putting on a life jacket in a hurry, wearing a life jacket before an emergency arises ensures a greater chance of survival.

Alaska State Standards:

Physical Education Grades 6-8:
E.2 Demonstrate concern for safety of self and others during games and activities.

Skills for a Healthy Life:
A.1. Understand that a person's well-being is the integration of health knowledge, attitudes, and behaviors.
B.5. Evaluate what is viewed, read, and heard for its effect on personal well-being.

Materials:
- Several different size life jackets.
- A hallway, gym, or classroom space.

Objectives:
Properly fit a life jacket
Experience putting on a life jacket while in a hurry

Procedure: (ten minute activity)
1. Divide the participants into two equal teams.
2. Participants should then form two lines at one end of the classroom, hallway, or gym.
3. Place life jackets in a pile at the other end of the classroom, hallway, or gym.
4. To start, the first person in each line will run to the pile of life jackets, pick up one that is the right size, put it on, and then check it for fit.
5. The instructor will let each participant know if he/she has correctly fit the life jacket.
6. He/she will then remove the life jacket, and set it back down on the pile of life jackets.
7. The participant will then run back to his/her team and tag the next person in line.
8. The race is over when the first team to have each person complete the exercise is finished.

Discussion Question:
How difficult is it to put on a life jacket AND make sure it fits when in a hurry?

It is always best to have the life jacket on to start with than having to put it on in an emergency, especially if the life jacket is stored. Remember, the law requires children under 13 to wear a U.S. Coast Guard approved life jacket when in an open boat or on the deck of a boat.

AlaskaBoatingSafety.org

Kids Don't Float
Cold Water Survival
Quiz

Please circle the best answer:

1. What is an example of a safe behavior when boating?
    a. Reaching overboard for an object
    b. Riding on the bow of the boat
    c. Seating everyone on the same side
    d. Sitting and keeping the boat balanced

2. During the first stage of cold water immersion (Cold Shock Response), how does a life jacket help you survive?
    a. Helps maintain an airway
    b. Deploys a mayday call upon initial immersion
    c. Reduces tingling in your fingers and toes
    d. Slows the heat loss from your head

3. What is one thing you should do within the first ten minutes of cold water immersion?
    a. Utilize communication and signaling devices
    b. File a float plan
    c. Kick off boots and shed bulky clothing
    d. Divide the group and swim in different directions

4. What is the term used to describe a drop in a person's body core temperature?
    a. Gasp reflex
    b. Cold incapacitation
    c. Frostbite
    d. Hypothermia

5. What is one thing that would make a life jacket non-serviceable?
    a. It's an ugly color
    b. It's too small
    c. It has a broken buckle
    d. It has a zipper

6. Alaska law requires that a person under what age must wear a U.S. Coast Guard approved life jacket when in an open boat or on the deck of a boat?
    a. 11
    b. 12
    c. 13
    d. 14

7. How do you know if a life jacket is U.S. Coast Guard approved?
    a. Is bright orange and has reflective tape
    b. Has an approval number on the label
    c. Fits properly in the water
    d. Floats a person on his/her back

8. How can you test to ensure a life jacket properly fits?
    a. Bend over and touch your toes
    b. Fill the pockets with survival gear
    c. Read the label
    d. Is snug and comfortable

9. You are going waterskiing, which life jacket would you choose?

a.

b.

c.

d.

10. What is the best life jacket?
    a. One you wear
    b. Most expensive one
    c. Your favorite color
    d. Newest one

KIDS DON'T FLOAT
Cold Water Survival
Course & Instructor Evaluation

Your Name:	**Date of class:**
School:	**Grade:**
# of Students:	**Instructor's Name:**

Did you find the presentation to be: **If 'no' to any, please describe why not**

Informative? →
Useful? →
Active? →
Fun? →

Did you find the length and content of the presentation to be age appropriate? If not, why?

What was the *most* useful piece of information provided?

Did the instructor cover all of the learning objectives?

__ Distinguish between risky and safe behavior while on or near the water
__ Describe three stages of cold water immersion
__ Explain 1-10-1 and how to survive a cold water immersion event
__ Describe how to choose a life jacket for its intended use
__ Locate manufacturers label on a life jacket; is life jacket U.S. Coast Guard approved?
__ Explain life jacket serviceability
__ Demonstrate how to wear a life jacket properly and how to check for proper fit
__ Identify legal age requirement for life jacket use

On a scale of 1 to 5 (1 = poor, 5 = excellent), please rate the instructor.

__ Was instructor on time and prepared?
__ Was instructor dressed professionally?
__ Was the material presented in an understandable manner?
__ Did the instructor demonstrate a thorough knowledge of the subject?
__ Was student participation encouraged?

What were the instructor's strong points?

Are there any topics that you would like to see that were NOT covered?

Any other comments or suggestions for the instructor or the program?

Please submit completed form to kelli.toth@alaska.gov or fax to (907) 269-8907

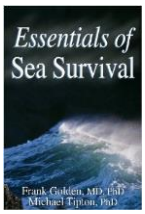
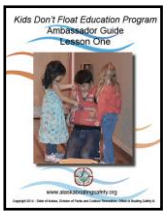
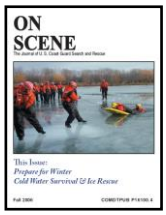
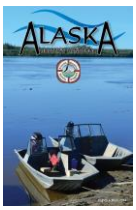
References:

Goldon, F. & Tipton M. (2002). *Essentials of Sea Survival*. Human Kinetics. Champaign, IL

Gungor, A. & Viauroux, C. (2014). *An empirical analysis of life jacket effectiveness in recreational boating.* UMBC Economics Department. Baltimore, MD.

State of Alaska. (2014) *Kids Don't Float Schools Program* Ambassador Guide Lesson One. Office of Boating Safety, Division of Parks and Outdoor Recreation, Department of Natural Resources. Anchorage AK. www.alaskaboatingsafety.org

Steinman, A. and Giesbrecht, G. (2006). *The four stages of cold-water immersion.* On Scene: The Journal of U.S. Coast Guard Search and Rescue. Washington DC.

State of Alaska. (2014). *Alaska Boater's Handbook.* Office of Boating Safety, Division of Parks and Outdoor Recreation. Department of Natural Resources. Anchorage, AK

Tipton, M.J. & Brooks, C.J. (2008). *Survival at Sea for Mariners, Aviators and Search and Rescue Personnel: Chapter 3 – The dangers of sudden immersion in cold water*. North Atlantic Treaty Organization and Research and Technology Organization. Retrieved from: http://ftp.rta.nato.int/public/PubFullText/RTO/AG/RTO-AG-HFM-152/$$AG-HFM-152-ALL.pdf