



# Teacher Guide

For *STEM-to-Stern* Programs



USS Hornet Museum Education Department

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## About This Document

Welcome Aboard! The following is a packet of information to prepare your students for your upcoming visit to the USS Hornet. In it you will find directions, program information, safety notes, and materials to facilitate and enhance your experience. If you have any additional questions, please feel free to contact us at (510) 521-8448 x 224 (Heidi Schave, Education Director) or x282 (Charlotte Rodeen-Dickert, STEM Education Manager).

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# Preparing for Your Visit

## What to Bring

- Comfortable shoes and clothes (You'll be moving around a lot!)
- A jacket, sweater, or sweatshirt (It can get chilly on the Flight Deck and down below.)
- A bag lunch or money to purchase food from vending machines or the café.
- Your enthusiasm and lots of questions!

## Organizing your Squadrons

To provide the best experience for our guests, we try to limit our tour groups to 12 or fewer students per Docent. Prior to your visit, please divide your group into smaller "squadrons" with at least one adult chaperone. Appoint one of these adults as a "squadron leader" per group. (This may need to be adjusted upon your arrival, but it helps to have the whole group already divided.)

## Background Information

Before you visit, we recommend that you take some time in the classroom to give the students a preview of their trip and perhaps go over some background information. If you would like some ideas, please ask us and we can direct you to interesting and fun resources to supplement what the students are currently learning or any special interests they may have. (Also see Appendix 1: *Hornet Fun Facts*)

*Note: Due to the historic nature of the ship, wheelchair and stroller accessibility is extremely limited. A lift from the pier to the main deck is available for wheelchairs and others needing assistance. Please advise when making reservations if your group requires this service.*

### Additional Resources:

This is a wiki put together by one of our docents, which has much information on STEM and the ship:

[https://en.wikipedia.org/wiki/User:Szirger/Books/USS\\_Hornet\\_Reference\\_Material](https://en.wikipedia.org/wiki/User:Szirger/Books/USS_Hornet_Reference_Material)

## Navigating to the Ship

### From San Jose and I-880 Northbound

Proceed toward downtown Oakland and take the Broadway exit. At the end of the ramp, follow the signs to Alameda, turning right on Broadway and then immediately turning right on 7th Street. Go two blocks to Webster Street and turn right again, entering the Webster Tube (tunnel) to Alameda. (Alternate: Turn left on Broadway and left again to enter Tube under the freeway overpass.)

*Alameda from the Webster Street Tube:* After emerging from the Tube, follow the sign for Webster Street. At the corner of Webster and Atlantic, turn right onto Ralph Appezatto Memorial Pkwy and drive approximately one mile. Turn left onto Main Street and then turn right onto W Pacific Ave to enter the former naval air station. At the intersection of Skyhawk St, turn left and drive to the end of the street. Turn right onto W Hornet Ave and proceed towards the cluster of large ships. Parking is located across the street from the pier. (See Detour instructions in the event of Tube closure.)

### From Sacramento and I-80 Westbound

Take I-880 south and take the Broadway/Alameda exit. At the end of the ramp turn right onto 5th Street. Stay in the right lane. Continue on 5th Street, remaining on street level. At the Broadway intersection, veer to your left to enter the Webster Street Tube (the Alameda entrance to the tunnel is under the freeway).

*Alameda from the Webster Street Tube:* After emerging from the Tube, follow the sign for Webster Street. At the corner of Webster and Atlantic, turn right onto Ralph Appezatto Memorial Pkwy and drive approximately one mile. Turn left onto Main Street and then turn right onto W Pacific Ave to enter the former naval air station. At the intersection of Skyhawk St, turn left and drive to the end of the street. Turn right onto W Hornet Ave and proceed towards the cluster of large ships. Parking is located across the street from the pier. (See Detour instructions in the event of Tube closure.)

### **From Walnut Creek and 24 Westbound**

Take Highway 24 to I-980 to downtown Oakland. Take the 11th/12th Street exit onto Brush Street. Proceed to 7th Street and turn left onto 7th Street. Turn right on Webster Street which will take you into the Webster Tube (tunnel) to Alameda.

*Alameda from the Webster Street Tube:* After emerging from the Tube, follow the sign for Webster Street. At the corner of Webster and Atlantic, turn right onto Ralph Appezatto Memorial Pkwy and drive approximately one mile. Turn left onto Main Street and then turn right onto W Pacific Ave to enter the former naval air station. At the intersection of Skyhawk St, turn left and drive to the end of the street. Turn right onto W Hornet Ave and proceed towards the cluster of large ships. Parking is located across the street from the pier. (See Detour instructions in the event of Tube closure.)

For more detailed information and maps, please visit our directions webpage at: <https://www.uss-hornet.org/visit-hornet/contact/driving-directions/>

# Welcome Aboard!

## At the Pier

When you arrive, plenty of free parking is available in the lot across from the ship's bow, with spaces available for bus and RV parking. Please, no vehicles on the pier — buses may drop off passengers and then return to the parking area. (We also recommend arriving at least 15 minutes prior to your scheduled program to allow time for a snack.)

Make your way up the pier to the first gangplank to the main entrance. To facilitate boarding, please:

- send a group leader up first to the admissions desk with the number of participants and payment (if not already received).
- organize into your squadrons before boarding.

## Backpacks

For your safety and the security of the museum, backpacks and large bags (including camera bags) are NOT permitted. Visitors will be asked to return backpacks and large bags to their vehicle. Smaller bags and purses are allowed, but are subject to search. (Please see Appendix 2: "Backpack Authorization Form for more information.) These and lunch bags will be safely stored during the program.

*Please note: For safety reasons, backpack-style infant carriers are also not permitted.*

## Coming Aboard

At the entrance, we will provide large buckets as a place for you to leave your lunches (and smaller bags). Docents and staff will direct you aft to Hangar Bay 3 for restrooms and to organize. Here, please try to stay with



your squadrons. Education staff will address the group and review the safety rules. From here, squadrons will break off with their Docent or staff tour leaders.

### Special Accommodations

As a WWII-era aircraft carrier, there may be some areas not accessible to persons of limited mobility. However, we can provide alternative tours, with advance notice.

### Safety First!

Our first priority is for you to stay safe as you explore this authentically-restored WWII-era aircraft carrier! For your safety and that of others, please observe the following rules:

1. **No Running!** (*steel decks can hurt!*)
2. See rule #1
3. Be exceptionally careful on all **Ladders**; Beware of **Low Overheads** and **Knee Knockers** (door thresholds)
4. Do not touch **Controls** and **Switches** – *this is a live ship and you could hurt yourself or others. We also cannot easily order replacement parts if something is broken.*
5. Heed all **Restricted Area** warnings and enjoy exploring the Hornet.

### Lunchtime and Afterward

There are several areas on the ship to eat lunch, if the weather is pleasant, the Flight Deck has picnic tables available. Alternatively, groups may eat in the Ward Room or the Chief Petty Officer's Mess. Following your tour, students will be directed to the buckets to retrieve their lunches and guided to the lunchtime location. Snacks and Beverages are available from vending machines on the main deck every day, and there is a café on the

Hangar Deck. Please make sure to tidy up the eating area before you leave.

After lunch, you are free to tour the ship on your own as your schedule allows. You may want to allow extra time for purchasing souvenirs and gifts in the Ship's Store.

Please feel free to talk to the many volunteers aboard the ship! They are great about sharing information about the ship, the restoration process, and their own experiences in the service. Some of them even served aboard the Hornet!

## Tour Station Descriptions

The following provides brief descriptions of the areas of the ship that you will see on your tour. Although we will do our best to show you these, on rare occasion some areas may not be accessible due to restoration work or safety issues. If this happens, we'll substitute another interesting area – there are many to see!

### **Apollo**

Our Apollo exhibit, includes several artifacts from the Apollo 11 and 12 (and other) missions and, such as a real test capsule and one of the Mobile Quarantine Facilities (MOFs) from Apollo 14. We'll learn about the history of the amazing technological achievement of getting to the moon and back and see what it can teach us about the engineering design process.

### **Hangar Deck**

The Hangar Deck, where aircraft were stored, repaired, and maintained when not in use, now contains several planes and helicopters from

different time periods. We'll look at these up-close to explore aircraft design and aviation basics.

### **Fo'c'sle**

In the Forecastle, the anchor was controlled for deployment and retrieval. We'll learn about simple machines, which use leverage and other principles of physics to move heavy (very heavy!) loads, such as these massive chains and the anchors. In addition, we can hear about the typhoon of 1945 that destroyed part of the forward flight deck and led to the improved "hurricane bow" design.

### **Flight Deck**

Up on the Flight Deck, we'll walk around where airplanes were launched and helicopters took off. We'll learn about some important principles of weather and aviation, and how these interact for pilots, as well as catapult system mechanics and flight,

### **Island**

The Island was where the Captain, Admiral, and crew navigated the ship through waters around the world. Up here, we'll see the different methods and evolution of navigation technology to determine position and establish a course. We'll also learn how waves are used to track other vessels and aircraft.

### **Engine Room**

Down in the Engine Room, we'll see how steam from the boilers powered everything on the ship. We'll also follow how turbines, generators, and gears harnessed the energy to do so many things at once.

## Catapult Room

In the port-side Catapult Room, heavy machinery using principles of physics enabled *Hornet* to launch aircraft from the deck. We'll see how a catapult system uses energy (*potential energy*) to apply a force to an airplane so that it can move with a high enough velocity (*kinetic energy*) to launch from the ship.

## STEM Activity

Your program includes a "STEM stop" that includes a hands-on activity relating to the science and engineering the students will see on the ship. The following provides examples for each topic area:

Mechanics: Catapults

Aerospace: Paper gliders or straw rockets

Electromagnetism: squishy circuits, coin batteries, or magnets

Electrochemistry: corrosion or electroplating (6-12)

# Appendix 1: USS Hornet Fun Facts

*Class	Essex
*Keel Laid	August 3, 1942
*Launched	August 30, 1943
*Commissioned	November 29, 1943
*Decommissioned (1st)	January 15, 1947
*Commissioned	September 11, 1953
*Decommissioned (2 <sup>nd</sup> )	June 26, 1970
*Apollo 11	July 24, 1969 (Moon Mission Recovery)
*Apollo 12	November 24, 1969 (Recovery)
*Builder	Newport News Ship Building & Dry Dock Com.
*Length, Overall	894 ft
*Flight Deck Length	846 ft
*Length at waterline	820 ft
* Beam at Waterline	101 ft
*Draft (Normal)	30 ft
*Boilers	8 – Babcock & Wilcox
*Engines	4 – Westinghouse Geared Turbines
*Top Speed	33 Knots
*Propellers	4 – Four Bladed
*Rudder	1 (429 sq ft)
*Catapults	2 –Type H8 hydraulic
*Aircraft Elevators	3 – (46,000 lb Capacity)

*Displacement, Full Load	41,200 Tons
*Anchors (2)	One Stbd, one at stem 30,000 lbs each
*Personnel (Ship/Airwing)	WW 2 – 3100 (Final- 2000+)

# Appendix 2: Backpack Authorization Form



Dear School Leader-

The USS Hornet Air Sea and Space Museum has new backpack security policy.

All backpacks are subject to search by our Security Team! We strongly recommend you remove your lunches and store your backpacks in the bus or car before boarding.

However, if you need to bring backpacks onboard please bring the following **SIGNED** form with you.

For the safety and security of all of our guests and crew, certain items are prohibited and will not be allowed aboard the USS Hornet. We ask that all group leaders assist us in screening bags prior to boarding. If found, the following items must be removed from bags and returned to vehicles in order for the group to board:



## The Following Item are Prohibited:

- Weapons of any Kind, Including Guns or Knives
- Alcohol
- Drugs (Medical Prescriptions In Bottles Exempt)
- Matches or lighters (Under 18)
- Fireworks

We appreciate your assistance in ensuring the safety of all our program participants. Please take the next few moments to ensure that each member of your group adheres to the Museum's bag policy.

Please sign below to certify that your group meets the safety requirements for boarding:

Date of Visit: \_\_\_\_\_

Name of Group Leader (Please Print): \_\_\_\_\_

Signature of Group Leader: \_\_\_\_\_

**\*PLEASE SIGN AND HAVE AVAILABLE UPON ARRIVAL**