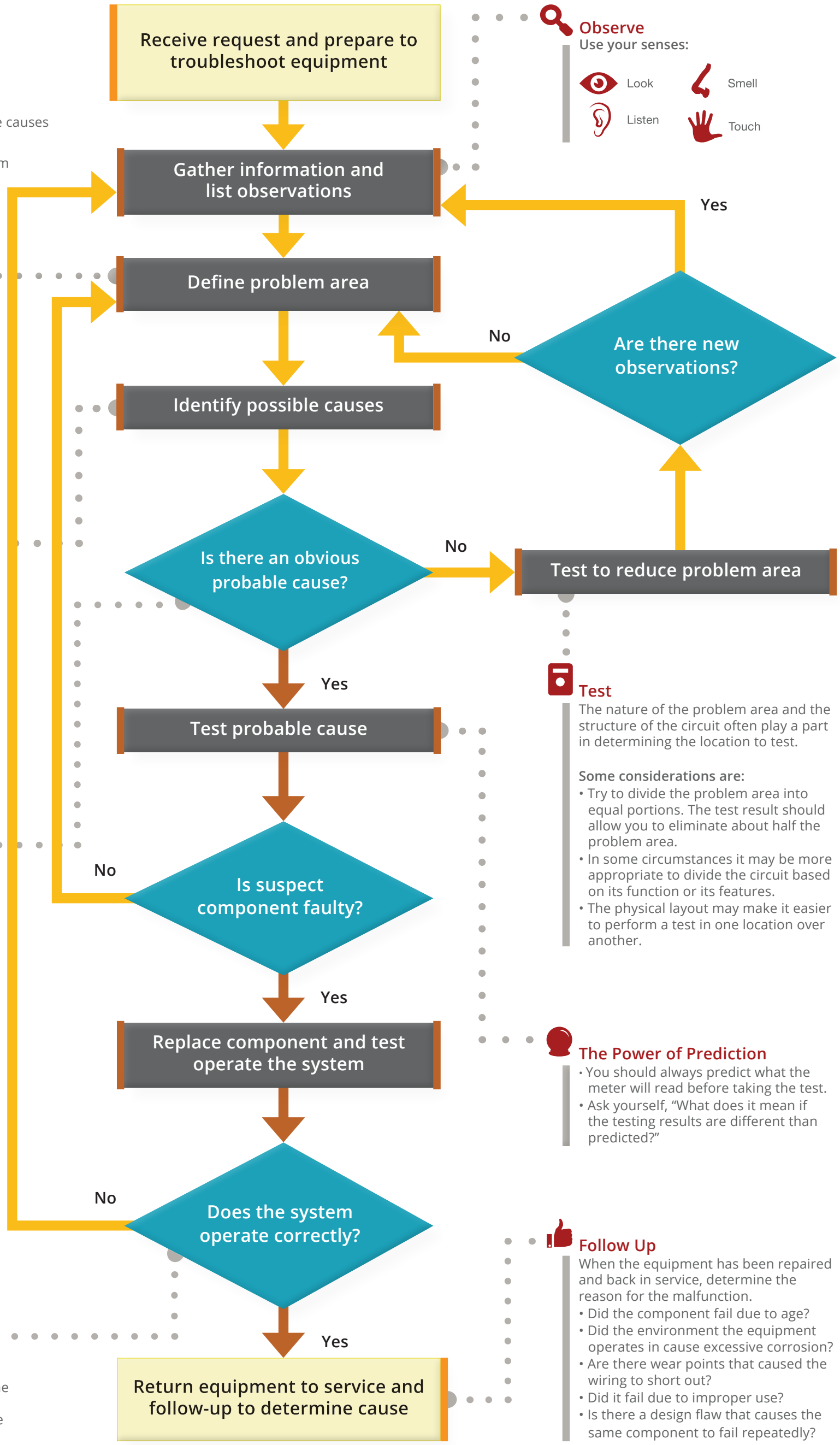
TROUBLESHOOTING SKILLS™ TRAINING SYSTEM

5-STEP SYSTEMATIC TROUBLESHOOTING APPROACH

The Systematic Troubleshooting Approach

Prepare
- Step 1: Observe
- Step 2: Define problem area
- Step 3: Identify possible/probable causes
- Step 4: Test
- Step 5: Repair/replace and confirm

Follow up



Observe

Use your senses:

Look · Smell · Listen · Touch

Define the problem area:

- Starting with the whole circuit as the problem area, take each noted observation and ask, "What does this tell me about the circuit operation?"
- If an observation indicates that a section of the circuit appears to be operating properly, then eliminate it from the problem area.

Identify possible/ probable causes

- It is necessary to identify all the possible causes of the malfunction and include every component in the problem area(s).
- Create a list of every fault that could be the source of the problem, no matter how remote the possibility of it occurring.
- Rely on your observations to assist with this.

Focus on probability

Some components are more likely to fail.

Check in the following order:
1. Fuses
2. Mechanical Components
3. Windings and Coils
4. Connections
5. Wiring

Full Tool Kit

There are many types of test instruments used for troubleshooting. Some tools are specialized instruments designed to measure various behaviours of specific equipment. Others, like the multimeter, are general and can be used on most electrical equipment.

Double check

After the component is replaced, be sure to test operate all features of the circuit to be sure you have replaced the proper component and that there are no other faults in the circuit.

Test

The nature of the problem area and the structure of the circuit often play a part in determining the location to test.

Some considerations are:
- Try to divide the problem area into equal portions. The test result should allow you to eliminate about half the problem area.
- In some circumstances it may be more appropriate to divide the circuit based on its function or its features.
- The physical layout may make it easier to perform a test in one location over another.

The Power of Prediction

- You should always predict what the meter will read before taking the test.
- Ask yourself, "What does it mean if the testing results are different than predicted?"

Follow Up

When the equipment has been repaired and back in service, determine the reason for the malfunction.
- Did the component fail due to age?
- Did the environment the equipment operates in cause excessive corrosion?
- Are there wear points that caused the wiring to short out?
- Did it fail due to improper use?
- Is there a design flaw that causes the same component to fail repeatedly?