

## “Given 20 ‘Destructible’ Light Bulbs (Which Break At A Certain Height), And A Building With 100 Floors, How Do You Determine The Height That The Light Bulbs Break?”

This head-scratcher was asked during a job interview. While the answer can be deduced from the facts, it is not designed to show the intelligence of a candidate, but rather to throw the candidate out of their comfort zone and see if they can create a practical way to solve the problem. It is important to be able to think logically on your feet in situations like an interview; you also need to be able to take time to think problems through using tried and tested method to solve them.

If one day you turn up to work late, the first thing you may have to do is report to your boss and explain why you have arrived late. It may be easy to blame bad traffic, or other uncontrollable events. However if you do not reach the root of the problem, it may happen again. There are several ways you can find the Root Cause to a problem. This one is called the “5 Why” technique.

### What is the 5 Why approach?

A method to find out the true causes of problems and to determine logical cause chains. It is useful when identifying causes (direct, contributing and root cause/causes).

### How does it work?

Start from a well defined problem and then state that problem as a question. Answer that question, and then pose the answer as a question.

Repeat the process until you reach a point where you can no longer influence change, and that is your Root Cause. It is important to remember that the chain can branch and multiply.

### Using the results

Grouped results often indicate areas of weakness, which require resolution.

### The Chain

If we apply this technique to our little problem, we can find the source of the problem which in turn means we can prevent it from recurring;

Event: Didn't get to work on time

Q: Why were you late?

A: The car wouldn't start.

Q: Why didn't the car start?

A: The battery was dead.

Q: Why was the battery dead?

A: The kids played in the car and left the door ajar.

Q: Why were the kids playing in the car?

A: The babysitter wasn't watching them.

Q: Why wasn't the babysitter watching them?

RC: Babysitter was asked to help clean the house.

### Test the Chain

Once you have reached what you feel is the Root Cause of the problem, it is important to test the chain, to check you have not missed anything. This is easy to do: it is as simple as climbing back up the chain and asking if the cause makes the result inevitable.

Root Cause: The babysitter was helping to clean the house

This caused the kids to play unsupervised

This caused the kids to be able to play in the car and leave the door ajar

This caused the interior light to be on all night

This caused the battery to die

This caused the car to not start

This caused the event: not getting to work on time



## Do I have to ask why 5 times?

This is a simple chain of 5 questions which lead to the Root Cause distracting the babysitter from doing her job; looking after the children. However the 5 Why technique does not need 5 Whys every time; it can be as many or as few Whys as is necessary to find the Root Cause of the problem.

It may also be that there is more than one chain with more than one Root Cause. This problem could have branches breaking off from it at various levels.

**Q: Why were you late?**

**A: The car wouldn't start**

**Q: Why didn't the car start?**

**A: The battery was dead**

**Q: Why was the battery dead?**

**A: The kids played in the car and left the door ajar**

**Q: Why were the kids playing in the car?**

**A: The babysitter wasn't watching them**

**Q: Why wasn't the babysitter watching them?**

**RC: Babysitter was asked to help clean the house.**

**Q: Why didn't you take a bus?**

**A: I did not know the bus routes**

**Q: Why did you not know the bus routes?**

**RC: I never had a contingency for the car breaking down**

**A: The battery was old**

**Q: Why was it not replaced?**

**RC: I never get the car battery checked**

## Guidelines for ending your chain

It is important to remember when using this technique not to go too far in asking Why. If you ask Why too many times, this can result in silly answers. Your answers must remain within your control and must be workable. In this example, we have reached a very workable Root Cause of the problem of being late with a simple and controllable solution: of leaving the babysitter to do her job.

## Conclusion

A Root Cause is the fundamental reason for an event which, if corrected, would prevent the recurrence. There may be more than one Root Cause to a problem, so it is important to let the chain lead itself to the final Root Cause.

