

# Sample

## Enterprising project



# Fishbone

## Measuring quality

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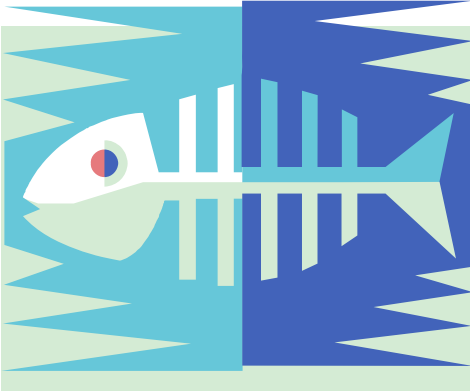
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# FISHBONE



## The Challenge

You are in a **partnership**.

Your aim is to learn about two problem solving techniques used in industry and other organisations:

- The fishbone
- Five-whys

You and your partner are to apply both techniques to the school and then introduce the techniques to people from local industry who may want to use them in their workplaces.

There are three parts to the challenge.

### Part one

Using the handouts, learn how to use the **fishbone technique** by applying it to two of the problems below:

- not enough people attending the school fete
- students eating too much junk food
- queues too long at the canteen
- student absenteeism
- bullying

To help, there are two samples attached and a blank template along with instructions. Besides your teacher, you will work with the deputy head teacher.

Using the handout, teach the deputy head how to use the **Five-whys** technique. Make sure you practise first. Ask the deputy to try the technique on the three students who were late this week. Also suggest he/she tries it on two students who were sent to her for 'behaviour reasons' in the same week. Arrange to meet with her the following week to discuss what happened. For example, was she surprised about some of the 'real causes' of the problems?

## Part two

The following week attend a **staff meeting** to:

- explain how the techniques work
- present your findings
- ask if there are other problems they want investigated

You will have a 15 to 30 minute segment.

## Part three

You and your partner must visit a local firm/s or invite the managers to the school, so that you can demonstrate the two problem solving techniques used. If there is time, they may want to 'have a go' with your help. Invite the deputy head to join you. Industry may be interested in the value of the techniques for finding solutions to problems in the following areas:

- Poor quality products or services
- Absenteeism
- Waste of materials
- Poor motivation
- Loss of time

Most managers will recognise the problems and causes when you show them the handout, Factory Production problem.

Before you meet with people from industry complete the **half way partner handout**.

Remember the more decisions and tasks you do yourselves, the more you will learn and the more fun you will have. If you want to change the project, talk to your teacher.

Before starting, you must list seven things that may cause the project to fail if they start happening - unless immediate action is taken. They will be known as Red Alerts.



Your teacher may offer you rewards (e.g. free-time) for doing well with this project. You may even be offered the chance to 'speculate' on your results to gain extra rewards. Be careful, speculation doesn't always pay off.

## Resources

You and your partner have:

- hours use of a computer
- A working space of your own
- hours help from the school finance officer
- £15 worth of 'credit' so you can use the school's telephone, fax, email, photocopier, postage and other equipment. The office staff will tell you about this.

You must purchase three hours advice from the head teacher. It will cost you £1 credit an hour.

## Conditions and rules

You must not contact a business without first telling your teacher. You must do this every time, not just the first time you talk to the business.

If industry people spend a fair bit of time in the school, organise some light refreshments. You can ask the teacher for an £18 grant for this. You must 'contract' a junior class to provide the refreshments. They should make some sandwiches, cakes etc. They cannot just buy pre-made foods from shops. Let your guests know that you have 'outsourced' the service from a junior class.

You must use the time-log supplied by your teacher to record what it did, when and for how long.

Finding ways to reduce your 'carbon footprint' when doing this project will benefit your assessment.

## Tips

Find out what professionalism is!

Avoid contacting businesses at busy times such as opening time, lunch and before closing. Some businesses might find text messaging convenient at times.

When demonstrating the fishbone to staff, ask them to have a 'quick go' at a topic/problem that annoys them. Without warning give a pen to a member of staff and ask them to record ideas as they are called out. Relax, staff will become involved and often have more fun than they do at most staff meetings.

Ask your teachers what is meant by a hands-on approach. And practice it whenever you get a chance when you are teaching.

While it is important to have things well organised, it is more important to know what you are talking about. But do not pretend to be experts. Make it clear that you are learning about techniques which you think staff might find the interesting and useful. Take a similar approach with industry, they in particular, will be okay. They love to see 'a kid having a go'. Practice using the five-whys with your friends and family. It can be fun.

If people from industry visit the school, talk to the head teacher about other activities that may be included in their visit. For example many may not have been in a class room for 20 years and would be fascinated to spend 15 minutes in a class as a student.

Likewise some may want to tell classes about their jobs **and** lives. They may want to spend time with the head teacher.

## Assessment

- 1 You will award yourself a score out of 17 but your partner must present evidence on **your behalf** to support your claim (award). Your partner will do the same. You cannot have the same scores. (Your teacher will explain this).
- 2 The deputy head will rate your success in teaching him/her how to use the **Five-whys** out of 17.
- 3 The head teacher, three teachers and one non-teaching member of staff will rate your presentation at the staff meeting out of 23. The score will be averaged.
- 4 Three **industry people** will rate your professionalism out of 23. The score will be averaged.
- 5 Your teacher will rate your performance and success out of 20.

Your teacher will give you your final score out of 100.

If you think that a score allocated by someone other than the teacher is unfair or inaccurate, you can appeal against it. You must provide evidence and have the support of one other person involved in your assessment, such as a team member.

The appeal will be conducted in private by your teacher. Similarly your teacher **reserves the right** to adjust any of the ratings from others but he/she must talk to you first.

# Teacher notes

## Focus

Students are able to see how problem solving techniques can be used in real settings to solve real problems. They can see the practical value of taking a structured approach.

Working with industry in an engaged manner is invaluable. Examining the intricacies in such a focused manner improves understanding how businesses work.

Interestingly the students will find that most adults have no experience in applying quality improvement tools such as these two techniques. The students should expect a positive response. Businesses will appreciate the students' efforts and see the exercise as a genuine attempt to 'help them out'.

## Recommendations

Versions of this challenge have led to some very interesting findings and reactions in schools and some surprising, pleasant results in industry - in some cases saving serious money.

When students use fishbone diagrams (including demonstrating) do not insist on neat illustrations/diagrams – after all they are working tools. You should have a practice yourself before showing the challenge to the students ... perhaps with a colleague.

Encourage the students to study the handouts very closely. Taking the handouts home and discussing them is a good strategy.

As the challenge involves a staff meeting, you will be quizzed by the head teacher etc and perhaps even be required to make some assurances. Fair enough, but insist that the whole undertaking is about learning for students **and** staff. It may be necessary for the students to run things past the boss. The more you let the students take the lead in this process the better, in other words stay in the background.

Using the **Half way partner** handout is a good way to refresh the project and hopefully, further, if not improve the working relationship between the partners. Ask the partners to lodge their completed forms with you before sharing them with their partner. This way you can filter any negative judgments they make of one another. It might be the case that you need to know the realities but they only need to know a softened version.

When students analyse the **Five-whys** example below, it is important to stress that the cause of a problem is often not as obvious as it seems. For example, it is far from obvious that the trees died because the groundsman is grumpy. Often you need to 'drill down' to find the 'root cause'. Once it has been found the solutions are easier to find. It may be necessary to ask more than five whys.

Ask the students to apply the technique to actual problems, such as:

- Being late for school
- Arguing with their parents

It is especially hard for teachers to resist the temptation of unduly interfering with students' activities when outside organisations are involved. Even when you may resist direct interference, it is easy to 'over influence' and dilute the learning. Remember your job is to extract the learning from the activity, e.g. presentation skills, letter writing – not to 'puppeteer' activities. Your other job is supervision and regulation.

If you need to take a more active and direct role, do it upfront, not as a puppeteer. Ask the questions, seek their answers and demand they make the decision. If you think it is a very bad decision, ring an alarm with a comment like the following *I think I can hear an alarm bell, you better discuss it again*. And then you should go off and do something else for a little while.

Adequately **brief the head teacher** and the office staff, reminding them of similar issues. Given the public nature of the project, the head teacher in particular, will wish for 'total success'. Remind them that it is easy to see the 'fingerprints' of teachers all over students' work. Adults are more impressed by genuine efforts, even though it may be less than perfect and amateurish.

When advising, the head teacher should be very strict about times but avoid telling the students what to do. This will make the students value the advice. The head teacher's main role is to ask the students **questions** and help them to clarify their thoughts – 'drawing out, not putting in'. Similarly, advise office staff not to do the students favours. Making decisions about limited resources is fundamental to enterprise and life in general.

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It is super important that you re-familiarise yourself with the section on Working with Non-teaching Adults at the beginning of the book.

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Once a school commits to a system of real rewards, genuine attempts must be made to honour the rewards students have earned. See the appendix for details.

## Review-Reflection-Generalisation

Review - Reflection - Generalisation (RRG) is fundamental to learning from first-hand experience. Without it at least a third of the potential learning is lost.

Videoring activities such as meetings, always provides a good basis for discussion. In addition use strategies described in the appendix to stimulate RRG before, during and after the project, particularly the Paired Interview activity.

# Handout – Making a fishbone

Analysis, using the fishbone fish skeleton, helps to identify and explore the roots of a problem or the factors shaping an event.

General Process:

1. Write the problem or event in full in the box.
2. On each bone, brainstorm some of the specific causes in the area which may be contributing to the problem. At this stage there is no need to consider each possible cause, just jot them down in the fashion shown in the example.
3. Go through each cause and check that everyone has the same understanding of what it is supposed to mean.
4. Select the five most significant causes by circling them.
5. Write each of the circled causes on a chart and ask 'where', 'when', 'why' and 'how much' the cause may be contributing to the problem.
6. Collect more information on these questions about each cause. If the information doesn't indicate what is really causing the problem, go back and look at the other causes which didn't make it into the final five.

## Handout – Making a fishbone

Having the right names for types of causes is important. Generally most causes fit into the following groups.

Category	Other names used	Description	Examples
Policy	regulations, rules	why the organisation exists	<ul style="list-style-type: none"> <li>• make money</li> <li>• educate people</li> </ul>
Processes	procedures	how things should be done, or actual ways they are done	<ul style="list-style-type: none"> <li>• fold evenly</li> <li>• fold however</li> </ul>
People		behaviour and skills	<ul style="list-style-type: none"> <li>• lazy</li> <li>• shy</li> </ul>
Culture	beliefs and attitudes	way people think about things	<ul style="list-style-type: none"> <li>• who cares?</li> <li>• do what you are told</li> </ul>
Resources	equipment, materials, money	what you have got	<ul style="list-style-type: none"> <li>• old machines</li> <li>• no spares</li> </ul>
External causes	laws, competitors		<ul style="list-style-type: none"> <li>• changes to VAT</li> <li>• cheap imports</li> </ul>
Other	money		

## Handout – Half way partner

Are our ideas too ambitious? .....

Have we been hearing Red Alerts? .....

What is annoying you?  
.....

On what things do we waste too much time?  
.....

In what areas do we need to collect more evidence for our assessment?  
.....

Who is doing most of the work?  
.....

What surprises you about your partner?  
.....

What is my partner's major strength?  
.....

How could my partner improve his or her performance?  
.....

What things do you do, which might annoy your partner?  
.....

I like working with my partner because ...  
.....

Who helped you the most?  
.....

What things should I start doing differently?  
.....

## Handout – Five Whys example

### Problem

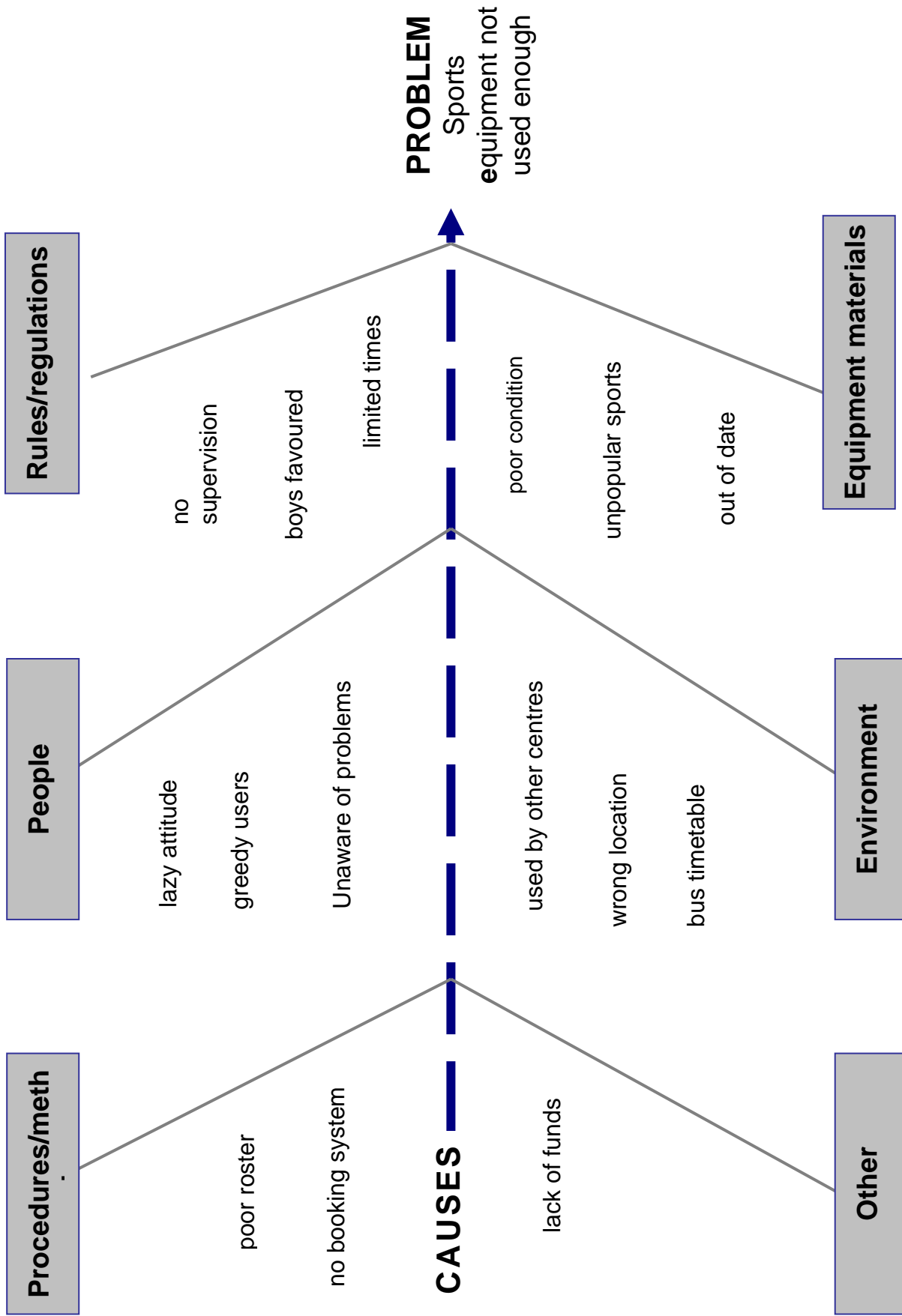
Three trees our team planted in the playground died over the weekend.

- **Head Teacher**            **Why?**
- Student                      Because they didn't get enough water
  
- **Head Teacher**            **Why?**
- Student                      Because nobody watered them on Friday
  
- **Head Teacher**            **Why?**
- Student                      Because we don't have enough people on the  
   roster
  
- **Head Teacher**            **Why?**
- Student                      Because two team members quit this week
  
- **Head Teacher**            **Why?**
- Student                      Because they didn't like the way our groundsman  
   treats them

Who would have guessed the tree died because the grounds-man is grumpy!

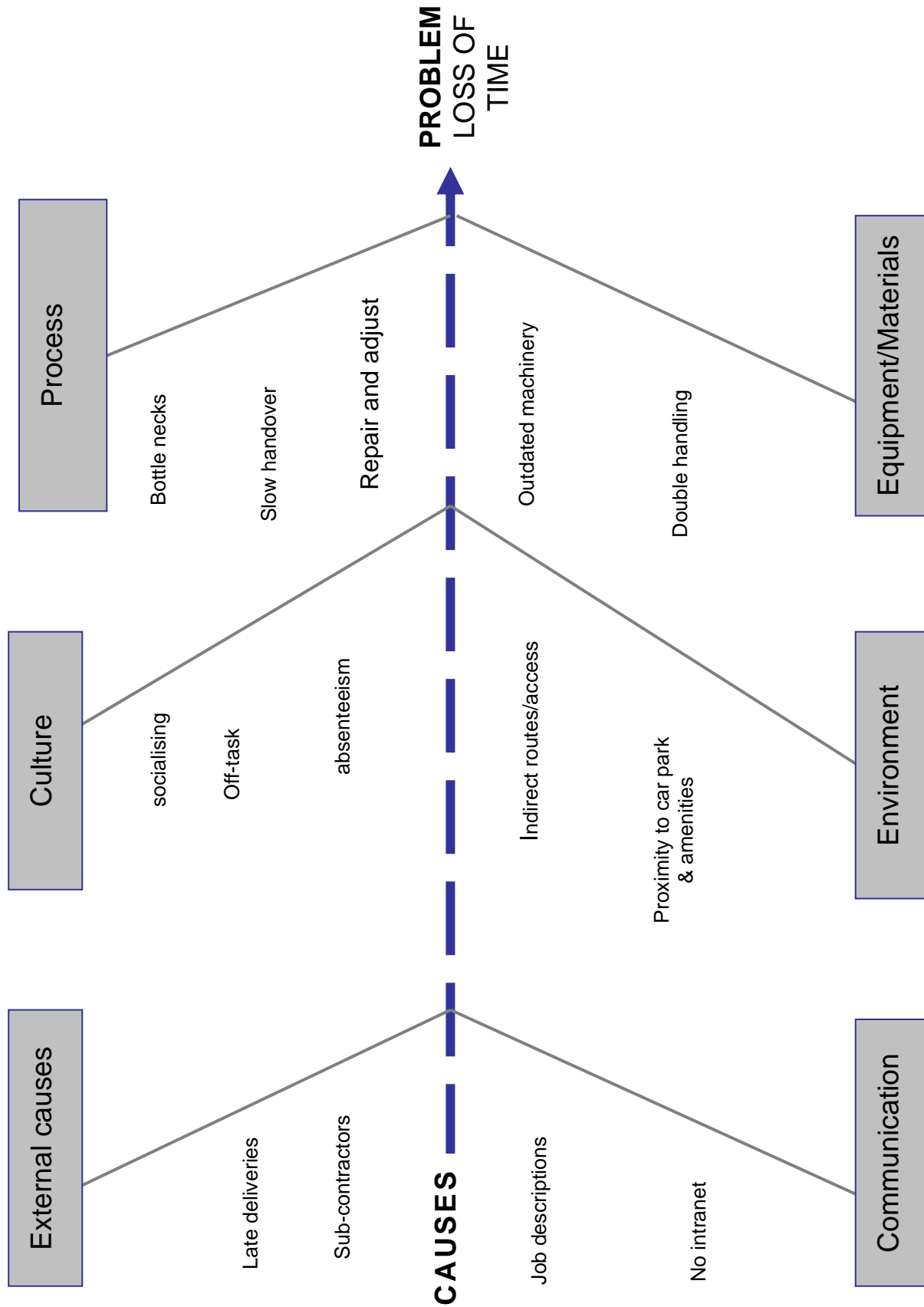
# Handout — fishbone sample one

## SPORTS CENTRE PROBLEMS



# Handout — fishbone sample two

## FACTORY PRODUCTION PROBLEMS



# Handout — fishbone blank

