E1 Conservation of linear momentum: explaining collisions
Example session plan

Aim
To consolidate the concept of the conservation of linear momentum.

Objectives/learning outcomes
- Describe and explain collisions using conservation of linear momentum.
- Develop the ability to use science terminology to correctly describe observations.
- Develop the ability to predict, test, and evaluate the effect of altering a variable.

Time	Teacher/trainer plan	Learner activity	Resources
00.00	Introduce topic and aims and objectives of session. Review previous learning on linear momentum. Ask learners for examples of where they have experienced collisions and how linear momentum is relevant. Take feedback.	Answering or asking questions. Confirming understanding. Groups of four discuss and list ideas about collisions. Record on sticky notes or flip charts. Feed back as group.	Sticky notes or flip chart paper and pens. Tape or adhesive putty.

Time	Teacher/trainer plan	Learner activity	Resources
00.15	Introduce activity: explain purpose and either demonstrate activity and/ or explain to groups how to set it up. Ask learners to use existing knowledge of momentum to explain: • what is happening? • why is it happening?	Learners: • watch demonstration and/or • set up activity on tables in groups of four • share explanations and come to an agreement about what is happening and why. Be prepared to answer questions.	Ball bearings, two strong cylinder magnets (available in the resources pack), runway (two rulers), OHP (optional). Tape or adhesive putty.
00.30	Take feedback from groups. Use open questions to review explanations, for example why, where, how, what.	Discussion, answering questions using mini-whiteboards.	Mini-whiteboards.
Time	**Teacher/trainer plan**	**Learner activity**	**Resources**
00.40	Consolidate learning and summarise. Then move on to higher-level tasks. Ask learners to apply learning in new situations when one variable is altered: for example, reduce mass of ball bearing B; estimate velocities of ball bearings. Some learners might investigate use of crumple zones.	Groups predict what will happen in different scenarios and then experiment to test their ideas. Summarise and annotate ideas on posters. Offer explanations.	
01.30	Conclude by reviewing and summarising learning and revisiting learning objectives.		

Assessment of learning outcomes
- Observation, assessment of explanations and answers.
- Responses to question and answers and contributions to discussions.
- Verbal and mini-whiteboard responses and posters.

Differentiation to meet individual needs
- Initial discussion to identify those that need additional learning support as well as those able to tackle more complex extension activities.
- Peer group selection strategies to pair less confident learners with more advanced learners.

Or:
- Group more confident learners together (extend the activities) and less confident learners together (provide additional support).
- Prepare extension activities to encourage more confident learners to explore topic in greater depth.

Teacher/trainer evaluation	Learner feedback
Consider which parts of the session were effective and why.	Consider whether the activities were suitable for all learners and the session helped develop as expert learners.

Personal and social skills developed
- Working as a member of a team and independently.
- Active listening.
- Communicating understanding clearly.
- Responding to questions.
- Sharing ideas and expertise with others and respecting others' opinions.

Skills for Life or Key Skills developed

Use your information to carry out calculations
N2.2.2 Check your methods to identify and correct any errors, and make sure your results make sense.
Interpret the results of your calculations and present your findings
N2.3.1 Select effective ways to present your findings.
N2.3.2 Present your findings clearly using a chart, graph or diagram and describe your methods.
N2.3.4 Describe what your results tell you and how they meet your purpose.
Take part in a group discussion
C2.1a.1 Make clear and relevant contributions in a way that suits the purpose and situation.