



SKILL ANALYSIS

SKILLS ANALYSIS

As a coach, you have the responsibility of telling your athletes whether or not they are using proper technique in their skills. You should also be able to tell them the specific corrections which will improve their skills.

Chapter Review:

- analyze sport skills using two principles of movement,
 - use all the body joints that can be used in a movement,
 - use all the body joints that are in the movement in the proper order,
- communicate corrections in performance that violate the principles by,
 - adjusting preliminary movements to ensure that all joints necessary to execute the skill are used,
 - breaking down movements into parts to teach proper sequence and timing.

Sharpening your abilities in skill analysis and specific feedback will assist in making you a better coach. It will also enable you to conduct meaningful practices by selecting accurate and specific drills. There are a total of six principles of movement. Two principles are covered in Level I and four additional principles are explained in Level II. These six principles apply to all sport skills.

Skill Analysis: What is it?

All the principles of movement are based on how forces are made by or act on the athlete's body. These forces produce movements of a certain speed, acceleration, or momentum and these properties of an athlete's movements, in turn, determine the quality of the skill.

A coach is a judge of skill. To be a good judge of sport skill, the coach must be able to:

- separate the strong parts of technique from the weak parts
- focus on the important parts of technique and not be distracted by the parts that are not as important
- find a way to correct technique
- break complex skills down into simpler parts
- put the whole technique back together

Experts in biomechanics have designed ways to assist you in developing your abilities to analyse and correct skill performances. These experts are sport scientists who have applied some of the basic ideas of physics to the analysis of sport skills and have come up with one primary message:

“There are a few principles of movement that explain how all sport skills are executed, whether on the land, in the water, or in the air.”

These principles are true for all sports. They explain how the parts of the body should be used when your athletes perform their skills. If you can understand and apply these few principles, you can become a skill analyst in hockey.

The two principles to be covered in this level are:

Principle 1: Use All the Joints That Can Be Used (summation of joint forces)

Principle 2: Use Each Joint in Order (continuity of joint forces)

Both of these principles apply specifically to power skills such as skating and shooting, where the athlete is trying to create as much force as possible.

Principle 1: Use all the Joints that can be used

Forces from each joint must be combined to produce a maximum effect. When all the joints that can be used are used, a step towards maximum performance has been taken. When available joints are not used they act as a hindrance. They substantially decrease the possibility of a maximum effort.

The important thing to remember is every joint that is part of the movement must be used to get the most speed, power, or acceleration out of each action.

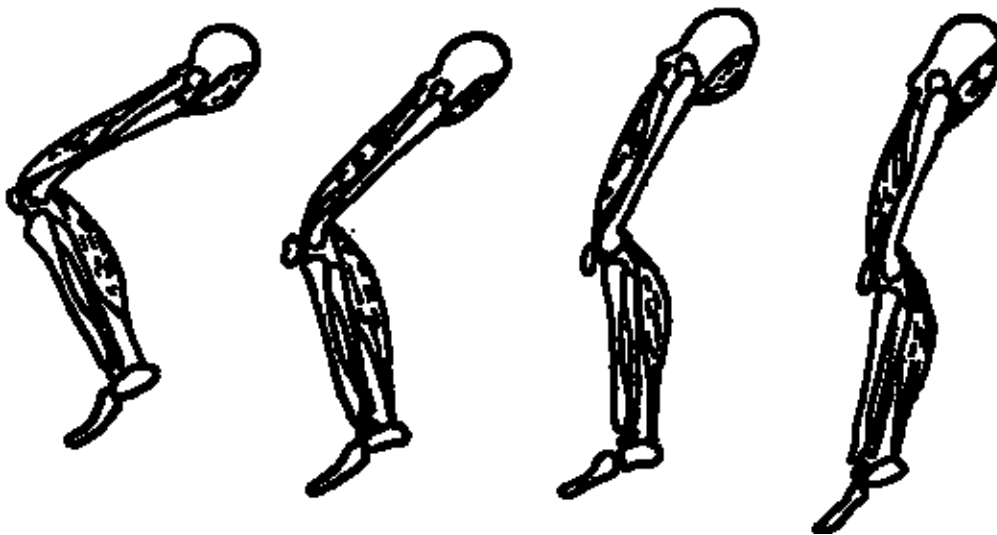
Here are some examples that will help you to understand Principle #1:

HOCKEY SKILL	FAULT	VIOLATION OF PRINCIPLE 1: USE OF ALL POSSIBLE JOINTS
Forward Skating	Extending only the hip and knee joints	Not extending ankle at end of stride
Backward Skating	Swinging hips from side to side	Not bending at the hips and knees; therefore, not extending from them
Shooting–Sweep Shot	Shooting with wrist only	Not using arms and shoulders in follow through

Principle 2: Use every Joint in order

When several joints are used in performing a skill, their sequence and timing are important. This principle tells us when the joints should be used.

Joints which have large muscles and are in the centre of the body should be used before joints that have small muscles and are found at the extremities of the arms and legs. Thus, movement should begin with the large muscle groups and progressively move out through to the smaller muscles – from big to small. The resulting motion should be fast and continuous producing a movement in perfect sequence without any breaks in the flow.



(A)
Hip Rotation
to Flatten

(B)
Knee Starts
Flattens

(C)
Knee
Rotation

(D)
Ankle

Figure 1: Joint Sequence in Skating



Here is an example of how this principle works.

HOCKEY SKILL	FAULT	VIOLATION OF PRINCIPLE #2: USE EVERY JOINT IN ORDER
Skating: backward to forward pivot	Rotating hips before opening shoulders in desired direction	Shoulders open in the direction of the turn and followed by the movement of the hips, knee, and ankle.

For the Coach

What are other examples of errors in performing hockey skills that are caused by a violation of Principle 2?

When watching athletes perform skills, you should ask yourself two questions:

- Did they use all the joints they should have used?
- Did they use the joints in the right order, without gaps or breaks in the movement?

Use the chart below to help you answer these questions.

Skill Analysis Checklist				
SKILL	PRINCIPLE		PRINCIPLE	
	1	1	2	2
JOINT	If should be used	If actually used	Order that should be used	Order actually used
Shoulder				
Elbow				
Wrist				
Hip				
Knee				
Ankle				
Others _____ _____ _____				
	Questions: What joints SHOULD they use? What joints DID they use?		Questions: In what order SHOULD the joints be used? In what order WERE the joints used?	

You are on your way to becoming an effective skill analyst if you understand the two principles of movement:

- use all the joints that can be used,
- use every joint in order.



Correction Methods

If your athletes violate any of the first two principles of movement, how do you correct the error?

There are two main correction methods:

- check for preliminary movements
- teach Whole - Part - Whole

Check for Preliminary Movements

Have you ever noticed that before you jump up, you have to crouch down? ... Before you throw a ball forward, you have to bring your arm back? Most preliminary movements are opposite to the pay-off movements that follow. Muscles are arranged in opposite pairs – so preliminary movements help stretch the muscles that do the pay-off movements. In the pay-off movements the stretched muscles contract. If your athletes are not using every joint that they should, you can tell them what preliminary movement is missing.

Coach Sam Skatewell has his team doing skating drills. One of his athletes keeps falling behind the others. Sam has noticed that his athlete is standing too erect and skating stiff-legged. He takes his athlete aside and explains that he is not using his hips, knees, and ankles (violation of Principle # 1: use all the joints that can be used). Coach Skatewell shows him how to bend at the hips, knees, and ankles (preliminary movements) before pushing off with those joints (pay-off movements).

Thus, to correct a violation of the “use all the joints that can be used” principle, you adjust preliminary movements so that the missing pay-off movements must be executed. Remember, the preliminary movements are opposite to the pay-off movements.

For the Coach

Select a hockey skill: front start, slap shot, tight turn, two-foot parallel stop, or some other specific skill. Using the chart below, identify the preliminary movements and the pay-off movements for each skill. Explain and demonstrate the appropriate preliminary and pay-off movements.

NAME OF SKILL	PRELIMINARY MOVEMENTS	PAY-OFF MOVEMENTS

Teach Whole - Part - Whole

Since violations of Principle 2 involve either the wrong sequence or timing of the parts of a skill, you have to break the skill down into its parts, practice those parts, and then put the whole skill back together again. This correction technique is called Whole - Part - Whole teaching.

Coach Buggins is having her team work on their two-foot parallel stops. She notices that one of her players is having trouble perfecting this skill because she is not rotating her head, shoulders, and hips prior to rotating her knees and ankles (violation of Principle #2: use every joint in order). Coach Buggins stops her athlete and has her observe a teammate who performs the stop properly. She then breaks down the components of the stop and has her athlete perform each component separately.

Standing still, the athlete rotates one foot inwards and pushes forward. This is called making snow. It emphasizes hip, knee, and ankle rotation, flexion, as well as proper skate edge use (inside edge – lead foot).

This same action is repeated, this time while performing a slow glide. Once the athlete feels comfortable with this “part”, emphasis can be placed on the inward rotation of the head, shoulders, and hips to enhance the stopping action.

Through gradual progression, the athlete is performing a strong one-foot stop. The second foot is now introduced paying careful attention to proper skate edge use (outside edge – follow-up foot).

Again, careful procedure to emphasize proper technique is used. Rushing through the skill in its entirety often confuses the learner and promotes bad habits.

Coach Buggins has to have her player perform this procedure several times before a proper two-foot parallel stopping action is achieved. By fitting the individual parts back together to create the whole, Coach Buggins has successfully taught this stop. She gives her athlete a pat on the back and continues with her practice.

Thus, to correct a violation of the “use every joint in the proper order” principle, you break the skill down into its parts to teach proper sequence and timing. Remember, you use the Whole - Part - Whole teaching method.



For the Coach

Select a hockey skill. Identify the parts of the skill. How would you use Whole - Part - Whole teaching to correct a wrong sequence or improper timing in performing the skill?

Name of Skill: _____

Components of the Skill: _____

Methods Used to Teach the Skill

Using Whole - Part - Whole:



SELF TEST

(Answers are on the next the page)

1. To be a good judge of skills a coach should be able to:
 - a. Break complex skills down into simple parts.
 - b. Focus on important parts of technique.
 - c. Correct the less improper technique.
 - d. Memorize and demonstrate every skill in their sport.

2. Feedback given to an athlete in correcting skills is:
 - a. specific
 - b. Constructive
 - c. not a personal judgment

3. True or False
 - a. T F Coaches must memorize all the skill techniques for their particular sport.
 - b. T F There are six principles of movement that explain how skills in many different sports are done
 - c. T F Whole – Part – Whole teaching is used to correct a violation of the “use every joint in order” principle.

4. Match the performance error in Column I to the movement principle in Column II that was violated:

COLUMN I

- _____ a. Player is skating stiff-legged
- _____ b. Player rotates hips before opening shoulder in a pivot
- _____ c. Player shoots using wrists only

COLUMN II

1. Use all joints
2. Joints in order

5. Match the correction method in Column I with the movement principle in Column II with which it is related:

COLUMN I

- _____ a. Adjust preliminary movement
- _____ b. Whole – Part – Whole teaching

COLUMN II

1. Use all joints
2. Joints in order



Answers

1. a, c
2. a, b, c
3. a, F; b, T; c, T
4. a, 1; b, 2; c, 1
5. a, 1; b, 2