



Saskatchewan Catholic Schools Curriculum Permeation

**REVEALING
CHRIST
IN ALL WE
TEACH**

Science 8

2012

“Revealing Christ In All We Teach”

A Curriculum Permeation initiative of the Saskatchewan Catholic School Boards Association

Introduction:

"The Gospel spirit should be evident in a Christian way of thought and life which permeates all facets of the educational climate. Prime responsibility for creating this unique Christian school climate rests with the teachers, as individuals and as a community." (The Religious Dimension of Education in a Catholic School, 1988 #25 -26.)

Teachers in Saskatchewan are mandated by the Ministry of Education to implement provincial curricula. Teachers in Saskatchewan Catholic Schools are further charged to utilize the “Revealing Christ in All We Teach” resources to permeate the Ministry curriculum with the Catholic world view.

Our Catholic schools seek to create a learning environment that reflects the identity and character of the Catholic Church. In each of our Catholic schools throughout Saskatchewan, we strive to become learning environments in which the uniqueness of our Catholic faith is expressed in all we do.

We believe that teaching in our Catholic schools is a ministry in which all are called to witness their faith. The teaching that occurs within our Catholic schools ought to reflect more than the content and objectives of the provincial curricula. In addition to these core fundamentals, we are called to infuse our Catholic beliefs and values in all subject areas.

In an ever-increasing secular world in which religious beliefs are dismissed, we must take up the challenge to see that the teaching of our Catholic values and beliefs are not limited to Religion and Christian Ethics classes alone, but are taught across the entire curricula. Our Catholic faith must permeate all subject areas! This undertaking is critical to the distinctiveness of Catholic education in Saskatchewan.

As Catholic educators, how do we permeate our Catholic teachings across the curricula? How do we, for example, discuss our church’s teachings on respect for the environment in science classes? How do we promote social justice in our studies of the humanities? How do we critique literary works through the eyes of our faith? In biology, how do we promote the sanctity of all human life, indeed, all of creation?

At the direction of the Saskatchewan Catholic School Boards Association, the following resource has been produced to assist teachers in the permeation of our Catholic faith across the curricula. A number of dedicated Catholic teachers in Saskatchewan have contributed to this resource by developing and sharing a variety of activities, lessons, and units for this purpose.



Please note: Teachers are invited to submit feedback and/or suggestions for additional faith permeation ideas to their Religious Education coordinator/consultant.

Saskatchewan Catholic Schools Curriculum Permeation

Gr. 8 Science - Faith Permeation Essential Connections

Unit Theme: Life Science - Cells, Tissues, Organs, and Systems

The focus of this unit is Life Science - Cells, Tissues, Organs, and Systems
The use of this unit will help students achieve the following Outcomes of the provincial Gr. 8 Science Curriculum: CS8.1, CS8.2, CS8.3, and CS8.4.

NOTE: All highlighted/shaded areas indicate faith permeation.

Catholic Faith Focus for Learning:

310. What are the effects of this sacrament?

The effects of the sacrament of Penance are: reconciliation with God and therefore the forgiveness of sins; reconciliation with the Church; recovery, if it has been lost, of the state of grace; remission of the eternal punishment merited by mortal sins, and remission, at least in part, of the temporal punishment which is the consequence of sin; peace, serenity of conscience and spiritual consolation; and an increase of spiritual strength for the struggle of Christian living.

313. How was sickness viewed in the Old Testament?

In the Old Testament sickness was experienced as a sign of weakness and at the same time perceived as mysteriously bound up with sin. The prophets intuited that sickness could also have a redemptive value for one's own sins and those of others. Thus, sickness was lived out in the presence of God from whom people implored healing.

314. What is the significance of Jesus' compassion for the sick?

The compassion of Jesus toward the sick and his many healings of the infirm were a clear sign that with him had come the Kingdom of God and therefore victory over sin, over suffering, and over death. By his own passion and death he gave new meaning to our suffering which, when united with his own, can become a means of purification and of salvation for us and for others.

319. What are the effects of this sacrament?

This sacrament confers a special grace which unites the sick person more intimately to the Passion of Christ for his good and for the good of all the Church. It gives comfort, peace,

courage, and even the forgiveness of sins if the sick person is not able to make a confession. Sometimes, if it is the will of God, this sacrament even brings about the restoration of physical health. In any case, this Anointing prepares the sick person for the journey to the Father's House.

391. What does the acceptance of God's mercy require from us?

It requires that we admit our faults and repent of our sins. God himself by his Word and his Spirit lays bare our sins and gives us the truth of conscience and the hope of forgiveness.

474. What duty do we have toward our body?

We must take reasonable *care of our own physical health* and that of others but avoid the *cult of the body* and every kind of excess. Also to be avoided are the use of drugs which cause very serious damage to human health and life, as well as the abuse of food, alcohol, tobacco and medicine.

Catholic Faith Big Ideas:

Students will understand that...

- our health is more than our physical health; we must also be spiritually healthy.
- our soul is part of our body.
- forgiveness is an important part of healing.
- the human body is treated with great respect by the church.
- the Catholic Church offers healing through reconciliation.

Catholic Faith Essential Skills:

The students will be able to...

- recognize that even though our bodies are the same, God has still made us all unique.
- recognize the importance of spiritual health on our whole body.

Catholic Faith Essential Questions:

- How can I be more like Jesus in mind and body?

Description of Culminating Task - Integrating Catholic Faith

Students will create a board game with both scientific and spiritual elements (from the unit).

Additional Resources:

Compendium of the Catechism of the Catholic Church

www.biblegateway.com

<http://www.srsp.net/new/downloads/leaflet.pdf>

<http://www.srsp.net/new/global/index.html>

<http://darwin.britishcouncil.org/activities/science-and-religion-age-16-19>

<http://darwin.britishcouncil.org/activities/created-by-nature-age-11-16>

Unit Instruction Plan/Lesson Sequence

Outcome CS8.1 Analyze the characteristics of cells, and compare structural and functional characteristics of plant and animal cells.

Lesson 1

Introduction:

When we look at cells, we notice that there are plant cells and animal cells. Every plant cell is the same; every animal cell is the same. However, this often leads to the question: if all plant cells are the same, how can there be so many different types of plants? Likewise if all animal cells are the same, how can there be so many different animal species? This relates to the Catholic Church in that, as each cell has structure and purpose, so too does each person in the Catholic Church. We are all one body in Christ and our purpose is to be Jesus to the world. Just as a cell needs all of its parts to function, so too does the Church. We are called to serve others and to live the Golden Rule: to love others as we want to be loved.

1. If we are all made of the same cells, why are we all different?

Outcome CS8.2 Demonstrate proficiency in the use of a compound light microscope to observe plant and animal cells.

Lesson 1

Introduction

Just as we put a cell under a microscope to examine it, we must also examine the things we do in our lives.

How is the examination of conscience similar to the use of a compound light microscope? (Both examine things that normally cannot be seen unless looked at with purpose.)

Outcome CS8.3 Distinguish structural and functional relationships among cells, tissues, organs, and organ systems in humans and how this knowledge is important to various careers.

Lesson 1

Introduction

We are all members of a church that is made up of many people.

“If one part [of the body] suffers, all parts suffer with it. If one part is honored, all parts are glad. – 1 Corinthians 12:26

If your stomach hurts, your whole body feels sick. When your stomach feels better, your whole body feels good and you’re happy again. That’s how it is with God’s family. If you feel sad, your church friends feel sad too. They want to hug you and pray for you. When something nice happens to you, your church friends feel happy and praise God along with you.”

Growing & Learning Day by Day - October 29th Reflection

Discuss how the body is made up of cells, tissues, organs, and organ systems and how they all relate to each other.

Relate that our church has a similar makeup. We have many parishioners that make up a parish. A group of parishes make up a diocese or arch-diocese. And lastly, all the dioceses put together make the entire church. The comparison could be made that individual parishioners are like cells, parishes are like tissues, dioceses would be like organs, and the whole church would be similar to the organ system.

Resources:

<http://www.bible.ca/catholic-church-hierarchy-organization.htm>

Growing & Learning Day by Day – A Devotional for Young Children (1998) – by Betty Free

Outcome CS8.4 Analyze how the interdependence of organ systems contributes to the healthy functioning of the human body.

Lesson 1

Introduction

Being Spiritually Healthy

We are all sinners. As a way to offer healing, the Catholic Church offers reconciliation. This is a way to say that God has forgiven us for our sins. In order to be truly healthy, we also need to be free of sin.

Just as the church offers us forgiveness it is important for us to also forgive others and follow the way of Jesus. If we have any resentment or hurt feelings that we are unwilling to forgive, we are harming our body's health.

Our healthy cells combined with our healthy choices are what create our healthy spirituality. Some people have very healthy bodies but do not make good moral choices. These people would have poor health spirituality. Others have healthy cells and also make good moral choices to be very spiritually healthy. Taking care of our bodies is one way to create some healthy spirituality since our body is referred to as our temple.

Guilt and shame can also do harm to our bodies. Guilt is feeling bad about what you did, and this is good because you recognize your sins and can have forgiveness for them. Shame is feeling bad about who you are.

God offers us all forgiveness.

How is spiritual wellness important to being a healthy person?

Teacher Catholic Faith Integrations Reflections

What have I learned about teaching this unit?

Subject: Gr. 8 Science

Unit: Life Science - Cells, Tissues, Organs, and Systems

What permeation ideas worked well in this unit?

How well did the permeation prompts engage the students?

Describe how the faith permeation prompts helped your students to grow in understanding the Catholic faith.

As a teacher, describe how the faith permeation prompts helped you to grow in understanding the Catholic faith.

It would have been good to have...

If I adapted / modified this unit I would...

General Comment:

If you are recommending changes to this resource, please provide a copy to your Religious Education Coordinator/Consultant.

UNIT 1: Cells, Tissues, Organs, and Systems

Saskatchewan Science 8 (Pearson)	Suggested integration of faith permeation ideas
Invitation to Explore p.7	
1.0 The cell is the basic scientific unit of all living things. p.6 1.1 An Invisible World p.7 1.2 The Microscope Extends the Sense of Light p.8 1.3 Cells and Their Structures p.12 1.4 Cell Structures and Their Functions p.19 1.5 Check Your Progress p.22	† Lesson 1 Introduction: When we look at cells, we notice that there are plant cells and animal cells. Every plant cell is the same; every animal cell is the same. However, this often leads to the question: if all plant cells are the same, how can there be so many different types of plants? Likewise if all animal cells are the same, how can there be so many different animal species? This relates to the Catholic Church in that, as each cell has structure and purpose, so too does each person in the Catholic Church. We are all one body in Christ and our purpose is to be Jesus to the world. Just as a cell needs all of its parts to function, so too does the Church. We are called to serve others and to live the Golden Rule: to love others as we want to be loved. CS8.1 Lesson 1 - page 19
2.0 Cells must interact with their external environment to meet their basic needs. p.24 2.1 Preparing Your Own Slides and Cells p.24 2.2 Investigating the Needs of Unicellular Organisms p.28 2.3 How Substances Move Into and Out of Cells p.31 2.4 The Effect of Water on Plant Cells p.35 2.5 Cell Specialization p.38 2.6 Check Your Progress p.41	† Lesson 1 Introduction: Just as we put a cell under a microscope to examine it, we must also examine the things we do in our lives. How is the examination of conscience similar to the use of a compound light microscope? (Both examine things that normally cannot be seen unless looked at with purpose.) CS8.2 Lesson 1- page 24-27
3.0 Your health depends on the effective functioning of your interdependent organ systems. p.43 3.1 A Look Inside p.43 3.2 Close-Up of the Circulatory System p.49 3.3 The Interdependence of Your Organ Systems p.52	† Lesson 1 Introduction “If one part [of the body] suffers, all parts suffer with it. If one part is honored, all parts are glad. – 1 Corinthians 12:26 If your stomach hurts, your whole body feels sick. When your stomach feels better, your whole body feels good and you’re happy again. That’s how it is with God’s family. If you feel sad, your church friends feel sad too. They want to hug you and pray for you. When something nice happens to you, your

<p>3.4 Check Your Progress p.56</p>	<p>church friends feel happy and praise God along with you.” <i>Growing & Learning Day by Day</i> - October 29th Reflection Discuss how body is made up of cells, tissues, organs, and organ systems and how they all relate to each other.</p> <p>Relate that our church has a similar makeup. We have many parishioners that make up a parish. A group of parishes make up a diocese or arch-diocese. And lastly, all the dioceses put together make the entire church. The comparison could be made that individual parishioners are like cells, parishes are like tissues, dioceses would be like organs, and the whole church would be similar to the organ system.</p> <p>CS8.3 Lesson 1 - page 48</p>
<p>4.0 Good health can be viewed as a balance among a person’s physical, mental, emotional, and spiritual wellness. p.59</p> <p>4.1 What Your Cells and Organs Need, So Does the Rest of Your Body p.59</p> <p>4.2 How Vital Substances Are Transported to and from Your Cells p.60</p> <p>4.3 Factors That Affect the Health of Your Cells p.64</p> <p>4.4 Traditional Medicine p.69</p> <p>4.5 Developing a Theory For Disease p.74</p> <p>4.6 Check Your Progress p.77</p>	<p>† Lesson 1 Introduction Being Spiritually Healthy</p> <p>We are all sinners. As a way to offer healing the Catholic Church offers reconciliation. This is a way to say that God has forgiven us for our sins. In order to be truly healthy we also need to be free of sin.</p> <p>Just as the church offers us forgiveness it is important for us to also forgive others and follow the way of Jesus. If we have any resentment or hurt feelings that we are unwilling to forgive we are harming our body’s health.</p> <p>Our healthy cells combined with our healthy choices are what create our healthy spirituality. Some people have very healthy bodies but do not make good moral choices. These people would have poor health spirituality. Others have healthy cells and also make good moral choices to be very spiritually healthy. Taking care of our bodies is one way to create some healthy spirituality since our body is referred to as our temple.</p> <p>Guilt and shame can also do harm to our bodies. Guilt is feeling bad about what you did, and this is good because you recognize your sins and can have forgiveness for them. Shame is feeling bad about who you are.</p> <p>God offers us all forgiveness.</p> <p>How is spiritual wellness important to being a healthy person?</p> <p>CS8.4 Lesson 1 - pages 64-65</p>

Project: The Game of Cells p.80 Unit Summary p.82 Unit Review p.84	Students will create a board game with both scientific and spiritual elements from the unit. Culminating Task - pages 80-81
--	--



Saskatchewan Catholic Schools Curriculum Permeation

Grade 8 Science: Faith Permeation Essential Connections

Unit Theme: Optics and Vision

The focus of this unit is **Physical Science: Optics and Vision**.
The use of this unit will help students achieve the following **Outcomes of the provincial Gr. 8 Science Curriculum: OP8.3**

NOTE: All highlighted/shaded areas indicate faith permeation.

Catholic Faith Focus for Learning:

- The greatest desire of the human person is to see God. “I want to see God” is the cry of our whole being. We realize our true and full happiness in the vision and beatitude of the One who created us out of love and draws us to himself with infinite love. (Compendium of the Catechism of the Catholic Church #533)

Catholic Faith Big Ideas:

Students will understand that...

- although we cannot see God, He is always present and shows his love for us.

Catholic Faith Essential Skills:

The students will be able to...

- explore how light, as well as God’s love, travel in straight lines; they will not bend.
- see God’s love in the creation around them and in our interactions with each other.

Catholic Faith Essential Questions:

- Why are we unable to physically see God as a being?

Description of Culminating Task - Integrating Catholic Faith

- Part 1 - Some people living in the far north experience depression and other similar illnesses during the winter. Research has shown this is partly due to the very short amount of time the Sun shines during the day. Which wavelengths of light would you want in artificial lighting where people work and go to school in these areas? Explain your reasoning.(Text page 175 #22)

- Part 2 - Explain how God's love can help people with depression and related illnesses and how God's interactions around them could still give "light" to their lives.

Additional Resources:

- Compendium of the Catechism of the Catholic Church #533

Unit Instruction Plan/Lesson Sequence

Topic 1: OP8.3

Compare the nature and properties of human vision with optical devices and vision in other living organisms.

Faith Permeation

God's love is a straight line; it will not bend. We see God's love through his creations as well as in how we interact with people.

Lesson 1 (God's Love)

Students will be placed into small groups (3 or 4). They will be equipped with a flashlight, mirrors (5), and a wood block. Students will spend time shining light off of objects (as well as objects in the room). Students will make observations of their experiments. Students will then complete three different tasks and explain what they observe: shine the light directly at the wood block; make the beam of light go over the wood block and continue; make the beam of light go all the way around the wood block (360 degrees). After students have completed their tasks, have them answer and discuss the following questions:

1. How does light travel? (Straight Lines)
2. How does the way light travels compare to how God loves us? (They both travel in straight lines. The light absorbs into the wood block the same way God's love is absorbed into us. It will not bend around us; it can be anywhere.)
3. What are some of the ways the light could have been blocked?

Lesson 2

Opening question: What are the images of God we see in our everyday lives?

Differentiate the places where we see God and the places where we struggle to see God. (Guide students to understand that interactions with others can determine how they see God through that person.)

Teacher Catholic Faith Integrations Reflections

What have I learned about teaching this unit?

Subject: Gr. 8 Science

Unit: Optics and Vision

What permeation ideas worked well in this unit?

How well did the permeation prompts engage the students?

Describe how the faith permeation prompts helped your students to grow in understanding the Catholic faith.

As a teacher, describe how the faith permeation prompts helped you to grow in understanding the Catholic faith.

It would have been good to have...

If I adapted / modified this unit I would...

General Comment:

If you are recommending changes to this resource, please provide a copy to your Religious Education Coordinator/Consultant.

UNIT 2: Optics and Vision

Saskatchewan Science 8 (Pearson)	Suggested integration of faith permeation ideas
Invitation to Explore p.88	
1.0 Light travels in straight lines and illuminance decreases with distance from its source. p.92 1.1 How Does Light Travel? p. 92 1.2 Illuminance and Distance p. 96 1.3 Check Your Progress p.98	<p>† Lesson 1 (God's Love)</p> <p>Students will be placed into small groups (3 or 4). They will be equipped with a flashlight, mirrors (5), and a wood block. Students will spend time shining light off of objects (as well as objects in the room). Students will make observations of their experiments. Students will then complete three different tasks and explain what they observe: shine the light directly at the wood block; make the beam of light go over the wood block and continue; make the beam of light go all the way around the wood block (360 degrees). After students have completed their tasks, have them answer and discuss the following questions:</p> <ol style="list-style-type: none"> 1. How does light travel? (Straight Lines) 2. How does the way light travels compare to how God loves us? (They both travel in straight lines. The light absorbs into the wood block the same way God's love is absorbed into us. It will not bend around us; it can be anywhere.) <p style="text-align: center;">OP8.3 Lesson 1 - pages 92-93</p>
2.0 The law of reflection describes how light reflects from a plane mirror. p.99 2.1 The Reflection of Light p.99 Experiment on Your Own: Light Reflection 2.2 The Reflection of Light Using Curved Mirrors p.106 2.3 Check Your Progress p.110	
3.0 Light is refracted by transparent materials, and this is what makes lenses so useful. p.111 3.1 Refraction p. 112 3.2 Using Refraction to Focus Light p.119	

3.3 Check Your Progress p.123	
4.0 The properties of light explain how the eye and the camera capture images. p.124 4.1 How Does Light Enter Your Eye? p.125 4.2 Other Optical Instruments p.130 4.3 Check Your Progress p.135	† Lesson 2 Opening question: What are the images of God we see in our everyday lives? Differentiate the places where we see God and the places where we struggle to see God. (Guide students to understand that interactions with others can determine how they see God through that person.) OP8.3 Lesson 2 - page 124
5.0 The visible light spectrum is made up of different colours. Colours hold special meaning for First Nations and Métis peoples. p.137 5.1 The World In Colour p.137 5.2 Seeing Colour p.143 5.3 What Colour Is It? p.144 5.4 Check Your Progress p.149	
6.0 Visible light is only one part of the electromagnetic spectrum. p.150 6.1 The Wave Model of Light p.150 6.2 The Invisible Spectrum p.153 6.3 Sources of Light and Other Forms of Electromagnetic Radiation p. 160 6.4 Check Your Progress p.167	
Project: Solar-Powered Systems and Wavelength p.170 Unit Summary p.172 Unit Review p.174	Part 1 – Some people living in the far north experience depression and other similar illnesses during the winter. Research has shown this is partly due to the very short amount of time the Sun shines during the day. Which wavelengths of light would you want in artificial lighting where people work and go to school in these areas? Explain your reasoning.(Text page 175 #22) Part 2 - Explain how God’s love can help people with depression and related illnesses and how God’s interactions around them could still give “light” to their lives.



Saskatchewan Catholic Schools Curriculum Permeation

Grade 8 Science: Faith Permeation Essential Connections

Unit Theme: Forces, Fluids, and Density

The focus of this unit is Forces, Fluids, and Density.

The use of this unit will help students achieve the following Outcomes of the provincial Gr. 8 Science Curriculum: FD 8.2, FD 8.3.

NOTE: All highlighted/shaded areas indicate faith permeation.

Catholic Faith Focus for Learning:

FD 8.2 – Examine the effects of forces in and on objects in fluids, including the buoyant force.

Matthew 8: 23-27

23After Jesus left in a boat with his disciples, **24**a terrible storm suddenly struck the lake, and waves started splashing into their boat.

Jesus was sound asleep, **25**so the disciples went over to him and woke him up. They said, "Lord, save us! We're going to drown!"

26But Jesus replied, "Why are you so afraid? You surely don't have much faith." Then he got up and ordered the wind and the waves to calm down. And everything was calm.

27The men in the boat were amazed and said, "Who is this? Even the wind and the waves obey him."

Matthew 14: 22-33

22Right away, Jesus made his disciples get into a boat and start back across the lake. But he stayed until he had sent the crowds away. **23**Then he went up on a mountain where he could be alone and pray. Later that evening, he was still there. **24**By this time the boat was a long way from the shore. It was going against the wind and was being tossed around by the waves. **25**A little while before morning, Jesus came walking on the water toward his disciples. **26**When they saw him, they thought he was a ghost. They were terrified and started screaming.

27At once, Jesus said to them, "Don't worry! I am Jesus. Don't be afraid."

28Peter replied, "Lord, if it is really you, tell me to come to you on the water."

29"Come on!" Jesus said. Peter then got out of the boat and started walking on the water toward him.

30But when Peter saw how strong the wind was, he was afraid and started sinking. "Save me, Lord!" he shouted.

31Right away, Jesus reached out his hand. He helped Peter up and said, "You surely don't have much faith. Why do you doubt?"

32When Jesus and Peter got into the boat, the wind died down. 33The men in the boat worshiped Jesus and said, "You really are the Son of God!"

FD 8.3 – Investigate and describe physical properties of fluids (liquids and gases), including viscosity and compressibility.

- The mystery of the Most Holy Trinity is the central mystery of Christian faith and life. It is the mystery of God in himself. It is therefore the source of all the other mysteries of faith, the light that enlightens them. Catechism of the Catholic Church # 234

- For as the Trinity has only one and the same nature, so too does it have only one and the same operation: "The Father, the Son, and the Holy Spirit are not three principles of creation but one principle". However each divine person performs the common work according to his unique personal property. Thus the Church confesses, following the New Testament, "one God and Father **from** whom all things are, and one Lord Jesus Christ, **through** whom all things are, and one Holy Spirit **in** whom all things are." Catechism of the Catholic Church #258

Catholic Faith Big Ideas:

Students will understand that...

FD 8.2 – The belief and trust in the power of the Trinity, gives buoyancy, courage, and strength on our journey through life.

FD 8.3 – There is a mystery that water comes in three forms (solid, liquid, and gas) just as there is a mystery of the Trinity (the Father who created us, the Son who redeems us, and the Holy Spirit who makes us Holy).

Catholic Faith Essential Skills:

The students will be able to ...

FD 8.2 – explain that God has a force that cannot be seen or often explained.

FD 8.3 – identify the three different states of water (solid, liquid, and gas) and the three different aspects of the Trinity (Father, Son, and Holy Spirit). Show how the three different states of water relate to the three different aspects of the Trinity.

Catholic Faith Essential Questions:

FD 8.2 – How is God showing his force when we are having difficulties in life?

FD 8.3 – Why do we have one God in three different persons?

Description of Culminating Task

You are Jesus; explain to your followers how you were able to walk on water while other people would sink. Then, use the Particle Theory to explain your observations of fluids, including density, effects of temperature, pressure, buoyancy, and compressibility and how these would make walking on water an impossibility.

Additional Resources:

Matthew 8: 23-27

Matthew 14: 22-33

Catechism of the Catholic Church #234

Catechism of the Catholic Church #258

Pearson Saskatchewan Science 8

Stand By Me

http://www.evidencetobelieve.net/images/trinity_diagram.jpg

Unit Instruction Plan/Lesson Sequence

Lesson 1 (FD 8.3) – Investigate and describe physical properties of fluids (liquids and gases), including viscosity and compressibility.

In Science, we often refer to the three states of matter. Water is an example we can show as having one chemical composition that can be a solid, liquid, and a gas (shown in figure 1). Give students a blank copy of figure 3 and see if they can complete a copy depicting how God relates to this. Have students use what they know from unit one of *Stand By Me*, grade 8 Religion textbook. (If students have difficulties, remind them that our God also comes in three forms: God the Father, God the Son, and the Holy Spirit – Figure 2.)

Figure 1

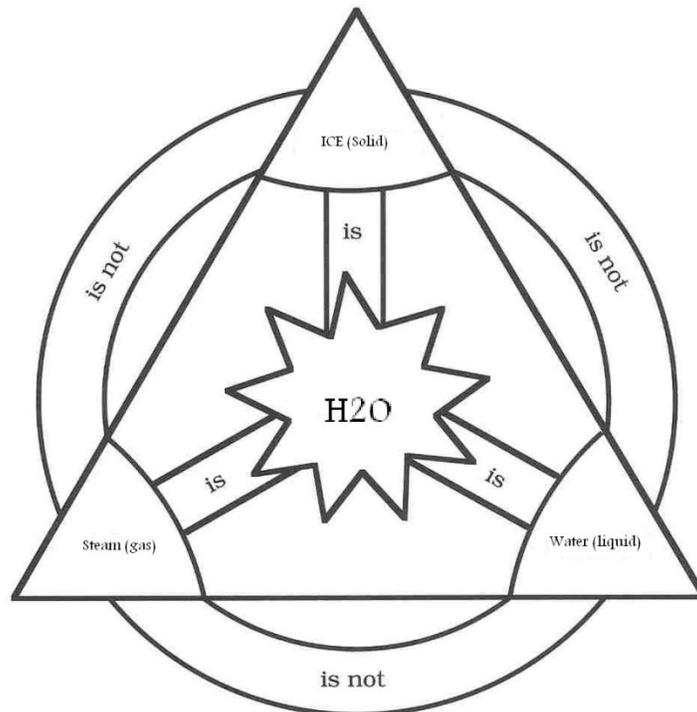


Figure 2

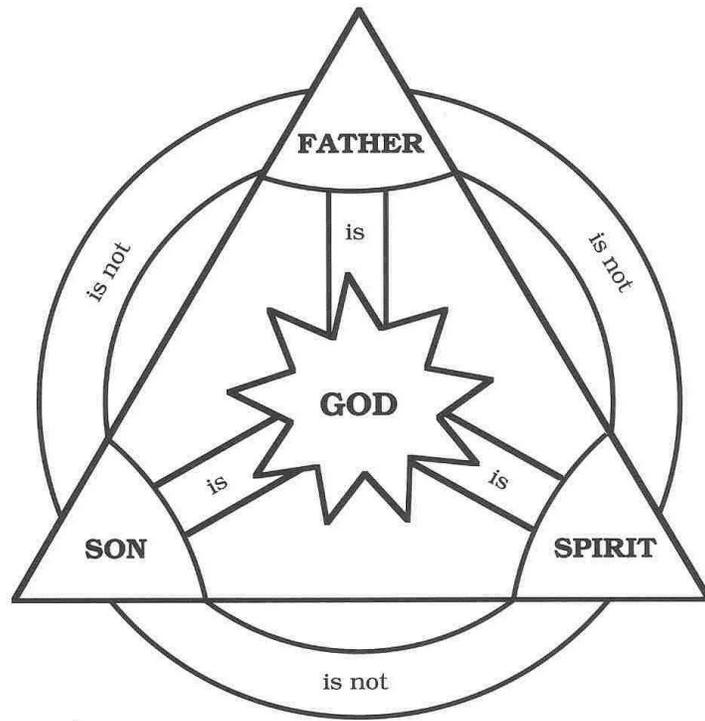
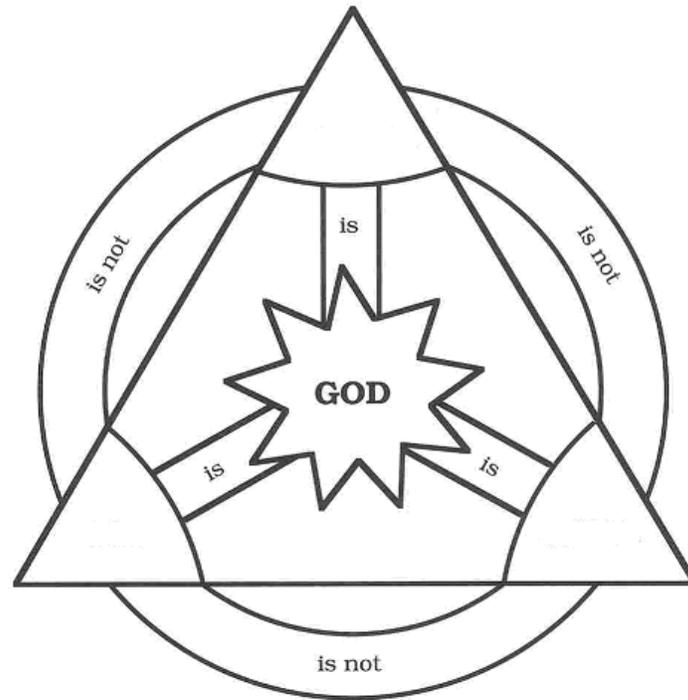


Figure 3



<http://www.gospelcenterreddiscipleship.com/author/robert-dukes/>

Lesson 2 (FD 8.2) – Examine the effect of forces in and on objects in fluids, including the buoyant force.

1. Have students read the passage Matthew 14: 22-33; discuss what stopped Jesus from sinking in the lake.
2. Read section 3.3 Boat Building (page 223) in Pearson’s Saskatchewan Science 8 textbook. Have students work on “The Best Boat” experiment on pages 224 and 225.
3. Continue with “Communicate” question and include question 12.
4. Question 12: After concluding the “Boat Building” experiment, all logic tells us that Jesus should have sunk when standing on the water. What spiritual factors applied to keep Jesus afloat? (Lead students towards God’s forces working in ways that we can’t imagine.)

Teacher Catholic Faith Integrations Reflections

What have I learned about teaching this unit?

Subject: Gr. 8 Science

Unit: Forces, Fluids, and Density

What permeation ideas worked well in this unit?

How well did the permeation prompts engage the students?

Describe how the faith permeation prompts helped your students to grow in understanding the Catholic faith.

As a teacher, describe how the faith permeation prompts helped you to grow in understanding the Catholic faith.

It would have been good to have...

If I adapted / modified this unit I would...

General Comment:

If you are recommending changes to this resource, please provide a copy to your Religious Education Coordinator/Consultant.

Unit 3: Forces, Fluids, and Density

Saskatchewan Science 8 (Pearson)	Suggested integration of faith permeation ideas
Invitation to Explore p.178 1.0 All fluids demonstrate the property of viscosity, or the internal friction that causes a fluid to resist flowing. p.190 1.1 Investigating Viscosity p.182 1.2 The Effect of Temperature on Viscosity p.189 1.3 Check Your Progress p.193	<p>† Lesson 1 (FD 8.3) – Investigate and describe physical properties of fluids (liquids and gases), including viscosity and compressibility.</p> <p>In Science, we often refer to the three states of matter. Water is an example we can show as having one chemical composition that can be a solid, liquid, and a gas (shown in figure 1).</p> <p>Give students a blank copy of figure 3 and see if they can complete a copy depicting how God relates to this. Have students use what they know from unit one of <i>Stand By Me</i>, grade 8 Religion textbook. (If students have difficulties, remind them that our God also comes in three forms: God the Father, God the Son, and the Holy Spirit – Figure 2.)</p> <p style="background-color: #00FF00; display: inline-block;">FD8.3 Lesson 1 - page 182</p>
2.0 Density is another important property of fluids. p.194 2.1 Weight, Mass, and Volume p.194 2.2 Water and Other Fluids p.196 2.3 Finding the Density of Substances p.199 2.4 Experimenting with Density p.204 2.5 Density and the Particle Theory of Matter p.210 2.6 Check Your Progress p.213	
3.0 Fluids exert a buoyant force on objects that causes some objects to float. p.214 3.1 Buoyancy and Forces p.214 3.2 Floating and Displacement p.217 3.3 Boat Building p.223 3.4 Floating and Density p.228 3.5 How Much Buoyancy? p.231 3.6 Check Your Progress p.23	<p>† Lesson 2 (FD 8.2) – Examine the effect of forces in and on objects in fluids, including the buoyant force.</p> <ol style="list-style-type: none"> 1. Have students read the passage Matthew 14: 22-33; discuss what stopped Jesus from sinking in the lake. 2. Read section 3.3 Boat Building (page 223) in Pearson’s Saskatchewan Science 8 textbook. Have students work on “The Best Boat” experiment on pages 224 and 225. 3. Continue with “Communicate” question and include Question 12. 4. Question 12: After concluding the “Boat Building” experiment, all logic tells us that Jesus should have sunk when standing on the water. What spiritual factors applied

	<p>to keep Jesus afloat? (Lead students towards God's forces working in ways that we can't imagine.)</p> <p>FD8.2 Lesson 2 - pages 223-225</p>
<p>4.0 Understanding the properties of fluids helps in the design and construction of useful devices. p.236</p> <p>4.1 Under Pressure p.236</p> <p>4.2 Volume, Temperature, and Pressure p.239</p> <p>4.3 Compression of Fluids p.242</p> <p>4.4 Hydraulic and Pneumatic Systems p.245</p> <p>4.5 Hydraulic Systems p.248</p> <p>4.6 Pneumatic Systems p.252</p> <p>4.7 Choosing a Hydraulic or Pneumatic System p.254</p> <p>4.8 Check Your Progress p.257</p>	
<p>Project: Rock Removal p.260</p> <p>Unit Summary p.262</p> <p>Unit Review p.264</p>	<p>You are Jesus; explain to your followers how you were able to walk on water while other people would sink. Then, use the Particle Theory to explain your observations of fluids, including density, effects of temperature, pressure, buoyancy, and compressibility and how these would make walking on water an impossibility.</p>



Saskatchewan Catholic Schools Curriculum Permeation

Grade 8 Science: Faith Permeation Essential Connection

Unit Theme: Water Systems on Earth

The focus of this unit is **Water Systems on Earth**.

The use of this unit will help students achieve the following Outcomes of the provincial Gr. 8 Science Curriculum: WS 8.2 and WS 8.3.

NOTE: All highlighted/shaded areas indicate faith permeation.

Catholic Faith Focus for Learning:

- Belief in the teachings of Jesus and the Catholic Church shapes our spiritual and moral lives in a positive way.
- This shaping leads to ongoing conversion.

Catholic Faith Big Ideas

Students will understand that...

- Like wind, water, and ice shape the Canadian landscapes, the teachings of Jesus Christ, as well as the teachings of the Catholic Church, shape us.
- That just as natural and man-made changes affect marine/fresh water environments, so faith in Jesus and the teachings of the Catholic Church can change the environment of our hearts when we are in times of trouble.

Catholic Faith Essential Skills:

The students will be able to...

- Identify the different aspects of their lives where the teachings of Jesus, as well as the Church, have helped shape them.
- Define what conversion means according to the teachings of Jesus and the Church.

Catholic Faith Essential Questions:

- We know that wind, water, and ice never stop shaping the Canadian landscape, but do the teachings of Jesus, as well as the Church, ever stop shaping us?
- Can God change our hearts for the better (conversion) without our free choice?

Description of Culminating Task

Students create a presentation to discuss the factors that cause change (conversion) in water's journey, using page 358 and 359 as a guide. Have students include how the teachings of Jesus Christ have caused change (conversion) in those who follow him. Include times when things

were difficult (solid-hard), when things seemed to be very easy and “flowing” for them (liquid), and times where they looked to God for help (gas-unseen).

Additional Resources:

Catechism of the Catholic Church #87

Catechism of the Catholic Church #2030

Acts 9: 1-9

Catechism of the Catholic Church #1427

<http://share1.esd105.wednet.edu/black1/venndiagram.htm>

Unit Instruction Plan/Lesson Sequence

Lesson 1 (WS 8.3) – Analyze natural factors and human practices that affect productivity and species distribution in marine and fresh water environments.

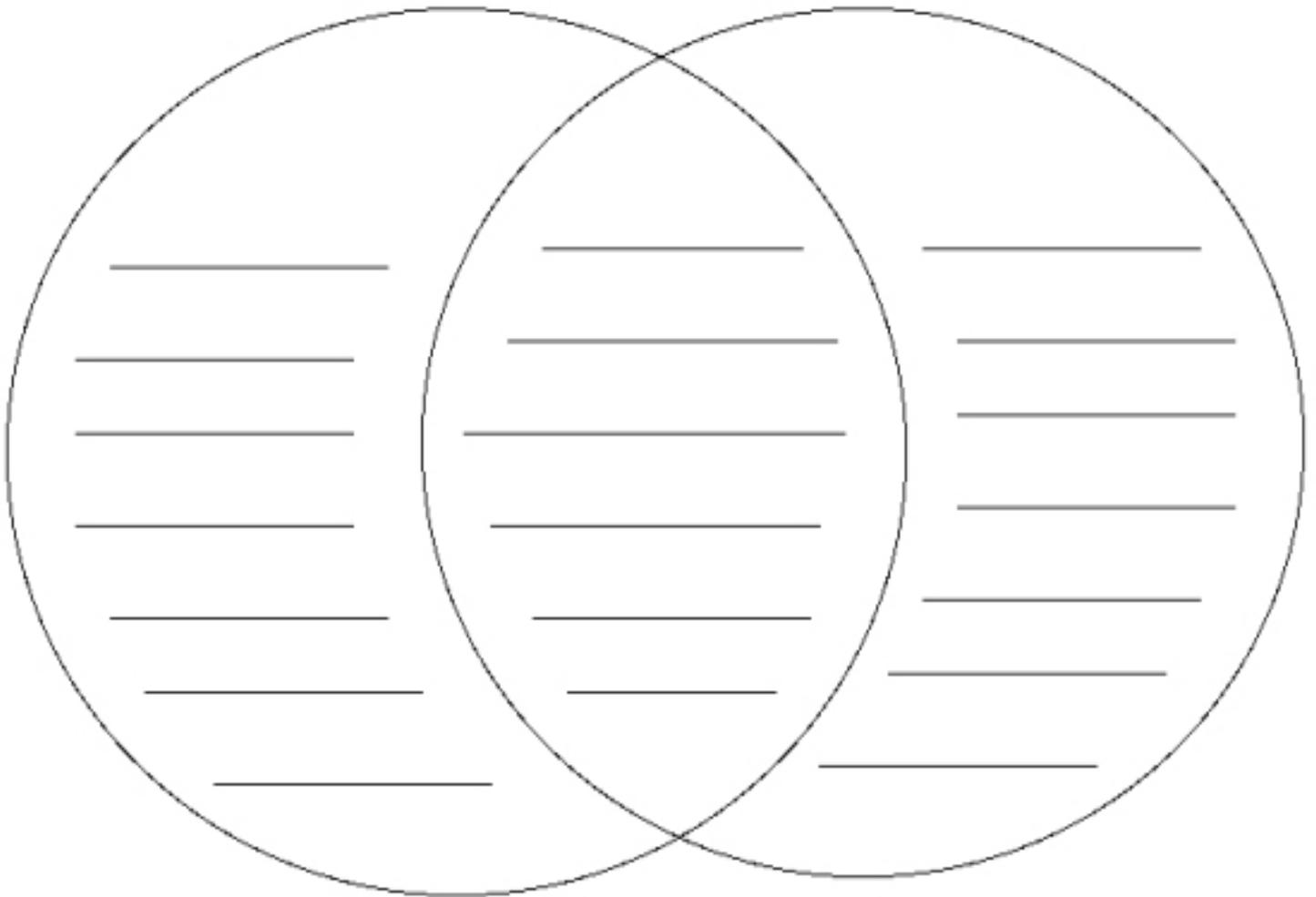
1. Orally read section Big Idea 2.0 “The Different Characteristics of Salt and Fresh Water Support a Diversity of Living Things”. Emphasize the importance of section 2.3 “Factors Affecting Living Things in Fresh and Salt Water” and stimulate in-depth classroom discussion. For example, page 293 “Company in Hot Water for Spilling It” (reading and questions).
2. After finished oral reading of section Big Idea 2.0, question students on the meaning of “Conversion”. Encourage and guide students to provide specific examples from the textbook.
3. Read Acts 9:1-9 and have students jot down interpretations of the reading. Discuss the conversion of Saul in this reading. Using the Venn Diagram provided, have students compare Saul’s conversion to the examples of conversion in the Science textbook.
4. Students independently complete Check Progress 1-6 on page 298. Have students also complete an additional question 7.
5. Question 7: Give an example of the conversion of faith (not Saul from Acts 9:1-9) either from a bible passage of your personal experiences. Can God change our hearts (conversion) for the better without our free will?

Lesson 2 (WS 8.2) – Examine how wind, water, and ice have shaped and continue to shape the Canadian landscape.

1. Display a picture of Perce Rock on the Gaspé Bay Peninsula.
2. Have students brainstorm ideas about how Perce Rock evolved to the state that it is in today, utilizing a Think/Pair/Share activity.
3. Explain the process in which the waves formed Perce Rock and stimulate discussion on what forms the individual, moral value makeup of each student.
4. Summarize the belief that Jesus, and the Catholic Church, added to the development of their individual beliefs. Continue to brainstorm the specific aspects of their personal lives and how Jesus Christ guided them in this formation. Use leading questions to assist students in arriving at the conclusion that this moral guidance will continue throughout their lifetimes.

name _____

date _____



Linda J. Burkhardt www.Lburkhardt.com

Teacher Catholic Faith Integrations Reflections

What have I learned about teaching this unit?

Subject: Gr. 8 Science

Unit: Forces, Fluids, and Density

What permeation ideas worked well in this unit?

How well did the permeation prompts engage the students?

Describe how the faith permeation prompts helped your students to grow in understanding the Catholic faith.

As a teacher, describe how the faith permeation prompts helped you to grow in understanding the Catholic faith.

It would have been good to have...

If I adapted / modified this unit I would...

General Comment:

If you are recommending changes to this resource, please provide a copy to your Religious Education Coordinator/Consultant.

UNIT 4: Water Systems on Earth

Saskatchewan Science 8 (Pearson)	Suggested integration of faith permeation ideas
Invitation to Explore p.268	
1.0 Water exists naturally in all three states on Earth's surface. p.272 1.1 The States of Water on Earth p.272 1.2 The Water Cycle p.275 1.3 The Water Table p.277 1.4 Check Your Progress p.282	
2.0 The different characteristics of salt and fresh water support a diversity of living things. p.283 2.1 Comparing Salt Water and Fresh Water p.283 2.2 The Diversity of Living Things in Salt and Fresh Water p.289 2.3 Factors Affecting Living Things in Fresh and Salt Water p.293 2.4 Check Your Progress p.298	<p>† Lesson 1 (WS 8.3) – Analyze natural factors and human practices that affect productivity and species distribution in marine and fresh water environments.</p> <ol style="list-style-type: none"> 1. Orally read section Big Idea 2.0 “The Different Characteristics of Salt and Fresh Water Support a Diversity of Living Things”. Emphasize the importance of section 2.3 “Factors Affecting Living Things in Fresh and Salt Water” and stimulate in-depth classroom discussion. For example, page 293 “Company in Hot Water for Spilling It” (reading and questions). 2. After finished oral reading of section Big Idea 2.0, question students on the meaning of “Conversion”. Encourage and guide students to provide specific examples from the textbook. 3. Read Acts 9:1-9 and have students jot down interpretations of the reading. Discuss the conversion of Saul in this reading. Using the Venn Diagram provided, have students compare Saul's conversion to the examples of conversion in the Science textbook. 4. Students independently complete Check Progress 1-6 on page 298. Have students also complete an additional question 7. 5. Question 7: Give an example of the conversion of faith (not Saul from Acts 9:1-9) either from a bible passage of your personal experiences. Can God change our hearts (conversion) for the better without our free will? <p style="text-align: center;">WS8.3 Lesson 1 - pages 283-298</p>
3.0 Bodies of fresh water	

<p>are created by geological processes. p.300</p> <p>3.1 Where the Water Flows p.300</p> <p>3.2 The Formation of Features on the Ocean Floors p.304</p> <p>3.3 Check Your Progress p.307</p>	
<p>4.0 Waves, tides, and currents are powerful forces that interact with the environment. p.308</p> <p>4.1 Waves p.308</p> <p>4.2 Regional Climates p.311</p> <p>4.3 Ocean Currents p.315</p> <p>4.4 Check Your Progress p.321</p>	<p>† Lesson 2 (WS 8.2) – Examine how wind, water, and ice have shaped and continue to shape the Canadian landscape.</p> <ol style="list-style-type: none"> 1. Display a picture of Perce Rock on the Gaspé Bay Peninsula. 2. Have students brainstorm ideas about how Perce Rock evolved to the state that it is in today, utilizing a Think/Pair/Share activity. 3. Explain the process in which the waves formed Perce Rock and stimulate discussion on what forms the individual, moral value makeup of each student. 4. Summarize the belief that Jesus, and the Catholic Church, added to the development of their individual beliefs. Continue to brainstorm the specific aspects of their personal lives and how Jesus Christ guided them in this formation. Use leading questions to assist students in arriving at the conclusion that this moral guidance will continue throughout their lifetimes. <p>WS8.2 Lesson 2 - pages 308-310</p>
<p>5.0 Large bodies of water and glaciers affect the environment. p.322</p> <p>5.1 Polar Icecaps Affect the Climate p.322</p> <p>5.2 Ocean Currents Affect Climate p.327</p> <p>5.3 Glaciers Affect Earth's Surface p.329</p> <p>5.4 Check Your Progress p.334</p>	
<p>6.0 People's use of water can affect Earth's water supply and the environment. p.336</p> <p>6.1 How We Use Water p.336</p>	

<p>6.2 Controlling the Destructive Power of Water p.342</p> <p>6.3 Processing Water for Human Use p.346</p> <p>6.4 Natural-Resource Development and Water p.350</p> <p>6.5 Keeping Our Water Healthy p.352</p> <p>6.6 Check Your Progress p.355</p>	
<p>Project: Water's Journey p.358</p> <p>Unit Summary p.360</p> <p>Unit Review p.362</p>	<p>Students create a presentation to discuss the factors that cause change (conversion) in water's journey, using page 358 and 359 as a guide. Have students include how the teachings of Jesus Christ have caused change (conversion) in those who follow him. Include times when things were difficult (solid-hard), when things seemed to be very easy and "flowing" for them (liquid), and times where they looked to God for help (gas-unseen).</p>