

This pocket guide equips you with strategies, ideas, activities, and practical tools to help you integrate equity, diversity, and inclusion (EDI) into your research adventures. You'll discover suggestions for actions that nurture inclusive research environments, as well as ideas that support the success of diverse teams. You'll also come upon resources for learning about different knowledge systems and research methodologies. This pocket guide is intended to stimulate reflection and spark action, but is not exhaustive. Science research is an endeavour that requires strong teamwork, communication, leadership, and preparedness. It is only through incorporating EDI into every aspect of each research expedition that we may reach new heights in science.



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#### Distribution:

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#### Feedback? Questions?:

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# **POCKET GUIDE MAP**



**REMEMBER**: You are not expected to become an expert in EDI. This pocket guide is here to support you on your journey to excel in science research, which includes fostering a culture of care and striving for inclusive excellence. Work in EDI requires awareness, education, and courage to engage in intentional actions to effect change, learning from both mistakes and new information.

## **How To Use This Pocket Guide**

Advancing EDI is an innovation challenge that can be tackled in familiar ways: experimenting with new methods, collecting data, adjusting tactics, and learning from both our mistakes and triumphs. This pocket guide offers inspiration to encourage scientists at every stage of their careers to integrate deliberative practices into their research journeys. Rather than being implemented all at once, the guide contains ideas and resources suited for various stages of these adventures.



## EDI Essentials: Quick References

Three Infographics featuring core competencies (bias, intersectionality, and allyship) with facts and tools specifically for science researchers.

# Advancing Equity, Diversity, and Inclusion: A How-To Guide

An article that highlights the importance of equity, diversity, and inclusion in scientific research, shedding light on the impact it can have on the STEM community.

## Concepts and Definitions

Key definitions and concepts related to equity, diversity, and inclusion that are critical to science research.

## EDI Skill Builders Base Deck

Strategies designed to alleviate worries when navigating the fields of EDI within your team.

## P SWOT: EDI Edition

A fundamental activity to assess and analyze areas of strength, weakness, opportunity, and threat (SWOT) for your team with respect to equity, diversity, and inclusion in research.

## Grant-Related Tools

Tools to help you craft grant proposals that prioritize equity, diversity, and inclusion in STEM research projects.

## NSERC Guide on Integrating EDI in Research

An official resource provided by the National Science and Research Council (NSERC), with best practices and guidance to help you incorporate equity, diversity, and inclusion into your research.

## 1. Assembling Research Teams

Accessibility | Indigenous & Other Knowledge Systems | Recruitment | Collaboration with Groups & Communities

## Did you know that...



#### Gender diversity is positively linked to collective problem solving.

Gender diverse teams better use each member's knowledge. overcome biases, and broaden their range of research questions. (source)

#### **Have You Considered?**

#### Indigenous research and reconciliation

Listening to, learning from, and working with Indigenous (First Nations, Métis, Inuit) communities, organizations, and researchers benefits science as a universal discipline across cultures, making science research more inclusive, valid, and accessible, while reducing harm from Western societal biases.

- ★ Weaving Indigenous knowledge into the scientific method
- ★ How to include Indigenous researchers and their knowledge

#### Completing EDI and bias training as part of recruitment committee activities

Learning effective strategies to help mitigate bias can support inclusive, accessible, and equitable recruitment processes.

- ★ Equitable and Inclusive Academic Hiring Practices Workshop
- ★ Online module: Bias
- ★ Online module: Hiring & EDI

### Engaging in outreach with students and local communities

Connecting with high school students/classes, and attending undergraduate conferences and junior researcher workshops, can support recruitment at different levels and programs for diversity of talent.

#### Expanding candidate pools by advertising positions on your research team

Posting ads for a minimum of 30 days in diverse public spaces, online forums, and dedicated networks that support members of underrepresented groups supports recruitment/inclusion of individuals who wish to work in these positions but face barriers due to social inequities and other factors.

#### Including individuals at different career stages in building your team

Inviting graduate students, research associates, or community members to be part of the recruitment process brings diverse perspectives and provides opportunities to learn about inclusive hiring practices.

#### **EDI Skill Builders**

#### Unconscious Bias in Hiring & Recruitment Activity Coming Soon

Have research group members watch the clip featured in the activity and use the guided lesson that follows to promote reflection and encourage discussion on the topic of unconscious bias in hiring/recruitment.

This activity highlights barriers that still prevent equitable hiring within post-secondary sciences. Group members will learn about unconscious biases, their harm to science, and how to overcome them, ultimately equipping members with better practices for both current work and future positions.



## 2. Fostering Inclusion Within Teams

Diversity within Teams | Safe Spaces | Collaboration | Sense of Belonging | Inclusive Work Environments | Accessibility

## Did you know that...

NEARLY of Canadian junior 1/4 female scientists drop out of STEM fields due to hostile work environments. isolation, and a major lack of effective mentors. (source)

The diversity of problem solvers within a team often matters more than individual ability.



Diverse teams do better science as they are more creative and productive, and process facts more carefully. (source)

#### **Have You Considered?**

#### Creating a lab or team handbook

Preparing a handbook (or creating one as a group activity) invites open communication between all team members, fostering an inclusive work environment with transparency around expectations.

- \* Handbook template and additional resources
- \* Research Culture: why every lab needs a handbook

#### Organizing regular research team lunches or gatherings

Gatherings at inclusive venues (e.g., LGBT+-friendly, alcohol-free, accessible) encourage collegial and friendly connections between team members, building community and fostering a sense of belonging.

#### Asking all group members about individual needs

Learning about and addressing needs (e.g., communication preferences, cultural/religious holidays, academic/workplace accommodations, flexible work arrangements) ensures equitable support.

- ★ Access checks: information & strategies
- ★ ACT to Employ as a resource for supervisors to learn and implement inclusive hiring and work strategies

#### Creating a group schedule for the term and seeking feedback

Creating a suggested schedule for the term and consulting with group members (maintaining privacy as required) acknowledges the breadth of possible accommodations, e.g., for an individual with a disability or chronic health condition, religious observances, family commitments. This also offers an opportunity to check in with group members about details related to group meetings, conferences, and events.

Expressing awareness of financial struggles, and providing resources and/or an invitation to chat

Bringing up the importance of financial support allows students with less privilege to feel less alone or stigmatized for problems and stress they might be facing.

#### Speaking with group members about asking for time off, breaks, or periods of reduced workload

Discussing time off can help to prevent mental health problems in trainees who may feel unable to ask for time off due to power imbalances or fears of disappointing their supervisor. By openly discussing how to take breaks or request time off, group members can understand that it is expected, and help them feel more comfortable about asking for time off.

#### Conducting an anonymous survey of your research environment

Creating and administering a survey helps leaders to understand team members' perspectives about the research environment and then to address issues to improve team climate and functioning.

★ Survey template for PIs

### **EDI Skill Builders**

#### **Bright Ideas Challenge**

With team members in pairs, ask a question where a range of responses will benefit the group (e.g., resources for creating accessible presentations, strategies for reducing bias in samples). Set a clock and ask each paired group to come up with a single list of responses. Compare lists between groups and cross off ideas that appear on more than one group's list. The pair with the most ideas left at the end wins.

This activity creates a shared list of strategies focused on improving EDI that can be added to the group handbook or webpage. It also highlights how multiple perspectives provide results that cover more bases and apply to more people. As well, inclusion is fostered amongst team members by having people voice ideas openly, encouraging a sense of safety and a sense of belonging.

#### **Prepared Prompts**

Assign a paper that focuses on an aspect of EDI within the field and ask each group member to read beforehand and prepare two discussion prompts for the next meeting.

This activity helps members to understand some of the EDI-related issues that are currently recognized in their field of study, while also encouraging them to think critically. This activity provides a safe environment for students to learn how to have open discussions regarding EDI topics and, furthermore, gain awareness about the value of learning other perspectives on these topics.

#### Micro Public Service Announcements (PSAs)

Learn about microaggressions from the website provided in the sample linked below, then ask each person to create a single PSA slide that brings to light one problematic term/phrase, why it is harmful, and a suggestion for a replacement that can be used instead. Slides can be added to a course deck for use as an EDI reference tool.

★"Micro PSAs" PowerPoint activity deck with sample slide

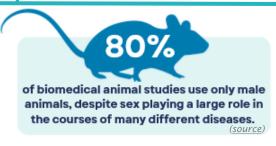
In this activity, group members will become informed about the often-misunderstood topic of microaggressions and effectively reinforce their knowledge and understanding through the creation of a slide to inform others. Furthermore, by asking team members to suggest replacement terms, group leaders promote actionable change through both the identification of the problem and by providing a solution for harmful language that has become habitual or commonplace.

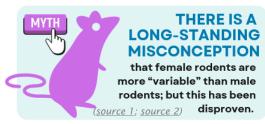


## 3. Designing & Conducting Research

Knowledge Exchange | Indigenous Knowledge | Fieldwork | Lab Research

## Did you know that...







Applying an EDI lens means systematically examining how diversity factors such as sex (biological), gender (socio cultural), race, ethnicity, age, disability, sexual orientation, geographic location, among other relevant factors, and their intersections may affect the research questions, the design of the study, the methodology, analysis, interpretation, and the dissemination of results.



#### **Have You Considered?**

#### Completing SGBA+ training to become familiar with concepts and processes

Completing this certification program (free) facilitates a broader working understanding of what SGBA+ is, and how various social factors and identities can influence outcome.

★ SGBA+ free certification program

#### Assessing population diversity within human samples

Ensuring that projects with human participants reflect diversity through aspects beyond sex (e.g., race, ethnicity, disability, sexual identity), which improves generalizability and reproducibility in your research, while providing valuable mechanistic insights and strengthening your research question (Note: for underrepresented groups, targeted recruitment is required to ensure a valid sample size).

#### **Ensuring diversity within non-human samples**

Considering diversity in non-human model systems (e.g., animals, cell lines) is important for generating results that accurately represent the human population.

★ Building inclusion into experimental design

#### Including sex and gender separately within your research, when applicable

Sex and gender are often poorly differentiated and contain many different aspects that greatly impact research. A more successful integration of sex and gender in research may be achieved through tools and considerations such as:

- \* Factors that differentiate sex and gender in research
- ★ CIHR resource list for tools and considerations when considering sex and gender in research

#### Reviewing research projects and methods for appropriate and ethical inclusion of gender

Incorporating gender into the various phases of the research process (e.g., experimental design, data analysis, knowledge translation) helps to produce results that are more robust and valid.

- ★ 3-minute video with tips on how to approach gender in research
- \* Research equity toolkit for measurements and methods

#### Using larger sample sizes in experiments with human participants

Including larger sample sizes increases the likelihood of capturing data that is more representative of the general public, with the potential of including more participants with different identities and backgrounds.

#### Integrating reconciliation in your research

Recognizing the need to bring reconciliation to all aspects of our scientific activities, from formulating research questions and teaching students to knowledge sharing and co-production, promotes scientific results that extend beyond Western perspectives. This paves the way for opportunities to listen to and share knowledge with Indigenous members.

★ The First Nations principles of ownership, control, access, and possession - more commonly known as OCAP

#### Including discussion of social factors relevant to the experimental research outcomes

Acknowledging the impact of social factors in research reduces the "blame" or categorization that members of equity-denied groups often face, enabling researchers to help support social activism.

\* Exemplary chart of social factors considered in science research for COVID-19 | Full article

#### Reviewing the motivations behind all design choices

It is always a good practice to ask "why" for all choices made. If the answer to this question is unknown, or this is the way it's always been done", it's likely a choice that should be reconsidered since traditional" approaches tend to reinforce oppressive values and attitudes.

★ Example of research practices that are helpful/harmful for racial equity

### Consulting resources specifically written for how to appropriately conduct research that includes/applies to an underrepresented group

Finding and using resources that outline best practices when including members from underrepresented groups within one's research enhances the research quality by reducing confounding variables that could result from overlooked details, lack of knowledge, or unconscious biases. Moreover, these resources help scientists to be mindful of ethical considerations specific to the group in question.

- ★ Example resource for best practices and key considerations when conducting research that includes trans people
- ★ Video: Why does race matter in scientific research? (~5 mins)

#### **EDI Skill Builders**

#### **Flexibility Tests for Mindsets Exercise**

Ask research team members to choose a topic that is lightly controversial and considered general knowledge (e.g., uniforms in schools). Have them write down which side they are on and then write as many reasons for it that they can find within three minutes. Ask them to create a second list for the opposing side and spend another three minutes writing as many reasons as they can think of. Have members look at both sides to decide whether they have the same number of points. If not, spend five more minutes coming up with points for the side with fewer points. Proceed with a discussion on the value and necessity of flexible thinking in science, and the other key points outlined on the activity sheet.

This activity increases flexible thinking by asking team members to be open-minded and actively seek out alternate points of view. It paves the way for discussions on critical topics such as the current dismissal of other knowledge systems by Western science, and the black-and-white thinking and categorical nature of Western thought.

#### **Researcher Pro-Tips**

Ask group members to share resources they use when researching topics and forming initial understandings of topics (e.g., Western journals, texts from experts in specific fields, YouTube videos, Reddit forums). Members should include the pros/cons of the resource, as well as the extra steps in their process to ensure the information is reliable. Group members may raise potential concerns and offer alternative solutions for each tool brought forward. These tools and extra steps can be included in the webpage or handbook as a helpful resource for other members.

All sources reflect biases. This activity helps expand the tools that researchers use for building knowledge and encourages individuals to start considering hidden biases and extra steps to ensure their comprehension and information reflects inclusive and equitable research. Furthermore, this activity equips all team members with a broader set of research strategies, which helps promote equity-building.



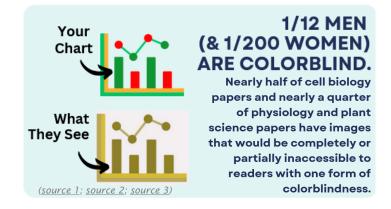
## 4. Communicating Science Research

Conference Presentations | Writing | Diverse & Neurodiverse Audiences | Opposing Viewpoints | Accessible Design

## Did you know that...







#### **Have You Considered?**

#### Including a land acknowledgment in your presentation

Acknowledging the Indigenous people to whom the land belongs supports reconciliation.

★ Example of a land acknowledgment

#### Using a variety of learning reinforcement methods with presentations

Handouts, group discussions, practical activities, and Q&A sessions can be used to support comprehension and engagement for all audience members.

★ List of different options for tools to help support audience learning in presentations

#### Reviewing your presentation for design accessibility

Adopting best practices will help what you are sharing to be heard and understood by all attendees.

\* Checklist for presentation design accessibility for science researchers Coming Soon

#### Learning about preferred communication styles for neurodivergent individuals

Becoming aware of possible differences in communication styles one might encounter when interacting with people at conferences can help reduce the chances of miscommunication.

- \* Neurodivergent point of view: Some common misunderstandings
- ★ Tips for neurodiverse social communication
- \* Stop asking neurodivergent people to change the way they communicate

#### **Explaining idioms if used**

An idiom (a group of words having a meaning not deducible from individual words, e.g., "raining cats and dogs") may not be understood by all, so including a brief explanation supports inclusive communication.

#### Using stories and metaphors to help communicate dense science topics to the public

Metaphors create links and narratives that human brains process more easily. Review metaphors carefully to check for words or implied meanings that may promote harmful stereotypes, oppressive attitudes, or ambiguity and misinterpretation.

- ★ The importance of narratives in science
- ★ The impact of chosen metaphors in science

#### Including a final slide at the end of presentations with key points and take-home messages

A summary slide of critical messages helps listeners who might struggle to remember key points due to factors such as disability, individual differences, or one's familiarity with the topic at hand.

★ PowerPoint template for take-home points slide

#### Including information related to the sample used when publishing findings on social media

Critical information related to sample such as gender, sex, country, and sample size reduces the likelihood of overgeneralization, misuse, and the spread of misinformation.

#### Highlighting the social factors that are relevant to research findings

Including the various potential social factors when sharing findings and ideas in presentations and through social platforms is critical to ensuring science does not become a tool that is used to support or perpetuate oppressive views (e.g., a link between cardiac problems and race should mention the social factors/stressors that led to genetic differences).

#### **EDI Skill Builders**

#### **Pictionary for Scientists Challenge**

Set a timer for three minutes and ask each group member to illustrate a result and have others guess the implications/significance). Once the timer finishes, have the group discuss things that were successful in the attempt, as well as things that they might have drawn to better communicate the research (e.g., type of graph, labels, the chosen piece of data).

In this challenge, groups discover new perspectives in ways to communicate findings and key points. This challenge also helps individuals better understand where their thought processes do not align with those of the audience, while providing various approaches for bridging the gap in understanding.

#### **Press Conference Activity**

Provide each student or team with a topic related to the research or field (e.g., self-learning AI, Earth's structure in space, COVID vaccines). Have individuals stand at the front of the room, or sit on one side of table, and take questions from the other group members (or the research lead) acting as a concerned party from the opposing side with misinformed views (e.g.: "self-learning AI will take over jobs", "Earth is flat", "vaccines magnetize"). Allow students to "ask the audience" for recommendations when stuck.



In this activity, group members learn how to diplomatically respond to difficult comments from audience members.

#### **Conversational Tools Exercise**

Ask each group member to use one of the included slides that features a tip for communicating effectively with neurodiverse populations. Have each member create an example using their own research of how they might incorporate this knowledge into a presentation.

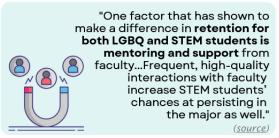
This practical exercise provides knowledge in the form of small, actionable items that will help students and researchers learn how to communicate more effectively with individuals who think differently, have a learning disability, or who identify as neurodivergent.



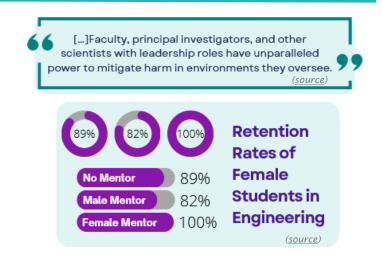
## 5. Leadership and Mentorship in Research

SGBA+ | Hiring | Remuneration | Empowerment | Reference Letters | Skills & Training | Team Management | Role Modeling

## Did you know that...







#### **Have You Considered?**

Using a rubric when hiring to evaluate candidates with the same criteria and to reduce bias

Rubrics based on objective criteria for a position may be a tool for guiding discussions.

\* Sample rubric template Coming Soon

#### Advocating for your research trainees to receive a living wage

A living wage enables them to focus on research/studies while reducing impossible choices (e.g., food vs. heat, rent vs. healthcare), health problems, and chronic stress.

★ Ontario-specific information regarding living wages

### Hosting accessible events involving people with diverse lived experiences, expertise, and identities

Inclusive events can bring together broad perspectives, provide role models, and enhance researcher career progression, thus encouraging engagement with a more diverse audience.

- ★ BlackInNeuro: an example of a community dedicated to helping connect organizers and individuals
- ★ How to host inclusive and accessible panels

#### Suggesting alternate speakers to event organizers if the panel lacks diversity

As an invited speaker, you can bring awareness to a lack of inclusion or diversity within a panel or event, encouraging organizers to ensure the diversity of speakers and participants.

#### Implementing strategies to ensure an equitable distribution of labour

Promoting workload equity addresses the burden often placed on members of equity-denied groups with heavy service loads, and so helps to alleviate conditions that lead to lower productivity and burnout.

★ Equity-Minded faculty workloads

## Providing links to undergraduates for institutional programs that offer experience and compensation

Access to opportunities with remuneration reduces barriers for students who cannot afford to volunteer.

★ Programs offering compensation with work experience

#### Mentoring and supporting new recruits beyond the confines of a specific project

Reaching out to offer help and resources (e.g., skill-building courses, registration guidance, language training, network building) actively supports the success of new group members, especially those experiencing EDI-related challenges.

#### Adopting strategies to limit unconscious bias in letters of reference

Focusing on addressing the reference criteria, avoiding stereotypical adjectives when describing skills and character, considering the use of 'stand-out' adjectives where appropriate (e.g., outstanding), and carefully considering doubt-raising statements can help mitigate unintended negative impacts.

- ★ Gender Bias Calculator
- ★ Best Practices for Letter Writers

#### Noting strengths of those with disabilities when providing references or feedback

Recognizing unique skillsets ensures group members with disabilities are not seen solely for their abilities to overcome challenges. Expanding knowledge on the strengths of various disabilities and reading spotlight stories of students and researchers can help to reframe disabilities as differences rather than disorders.

- ★ How to reframe disability
- ★ The different disability models

#### Reflecting on the language you use when speaking with group members about various topics

Knowing that the impact of words is critical and that language frames discourse, being mindful of word use and how topics are conveyed (e.g., "an at-risk individual" vs. "a system at risk of failing an individual") is often preferred by those affected. The language one chooses to use greatly influences perceptions and plays a role in nurturing a safe and inclusive environment.

★ Example guide for writing with inclusive language when publishing research

#### **EDI Skill Builders**

#### Leaders: Playing the Role Exercise Coming Soon

Assign each member a leadership-themed scenario (included) and have them complete the associated activity. Supervisors may also use scenarios as prompts for role-playing exercises.

Through these exercises, group members become familiar with leadership roles while concurrently learning how to cultivate a culture of inclusion and respect. These scenarios provide individuals with a safe and supportive environment to practice navigating situations equitably, while learning further about the importance of EDI within leadership and decision-making processes.



## **6.Travel Considerations**

Field Research | Safety when Travelling | LGBT+ Considerations | Transportation | Hotel Accommodations | Socioeconomic Factors | Inclusive Environments for Conferences | Parental Care Considerations

## Did you know that...



### **67 JURISDICTIONS** criminalise private, consensual,

same-sex sexual activity

(source)



Airport scanners require TSA agents to select "male" or "female" before a person enters the machine, leading to false flags and increased invasive searches or public situations that can cause severe trauma for an individual.

**48% OF THE TRANSGENDER COMMUNITY ARE UNLIKELY** TO TRAVEL BY PLANE. Some reasons specific to the transgender community: pat-downs (33%) body scans (31%) ID document problems, TSA procedures, lack of gender-neutral bathrooms, luggage inspections, & discrimination (22%)

#### **Have You Considered?**

#### Providing travel advances to reduce financial barriers

Travel advances allow those facing economic barriers (due to long wait periods for financial reimbursements) to join on research trips and excursions.

★ Information on travel advances

#### Setting up supports for female travel needs related to health, hygiene, and bodily functions

Accounting for needs related to the biological/physiological requirements (e.g., access to restrooms, menstruation products/disposal units) should be considered for research excursions/fieldwork.

#### Raising awareness and offering strategies to prepare for possible adversities

Providing a list of resources (e.g., emergency phrases in other languages, nearby safe locations) acknowledges that there are extra safety concerns for some folks and further offers practical strategies.

★ The need for more travel safety protocols for women in STEM (plus strategies)

#### **EDI Skill Builders**

#### **Inclusive Travel Tips**

Ask each member to make a slide with a suggested tip and brief description for an underrepresented group (e.g., BIPOC, women, individuals with disabilities, LGBTQIA2+ identities) that offers travel or tourism advice. These slides can then be added to a deck to create a resource for the research team.

Through this activity, group members learn of potential differences in experience/treatment for other populations when travelling. This builds a shareable resource that promotes inclusive thinking within the group while encouraging members to broaden their knowledge for their destination prior to departure.



## **Tools and Inspiration Going Forward**

Whether you are keen to continue exploring or ready to blaze a trail through the frontiers of scientific research, click here for a hand-picked selection of top-rated resources, personally recommended by scientists, researchers, and EDI experts across various fields of study.